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AMERICAN
RAILROAD JOURNAL,
MECHANICS' MAGAZINE

ANT

ASTOR, LENOX AND
TILDEN FOUNDATION

VOL. VII.—NEW SERIES.—No. 3. VOL. I.

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NEW-YORK:

PUBLISHED BY THE EDITORS AND PROPRIETORS,
D. K. MINOR, & G. C. SCHAEFFER, 120 NASSAU-ST.,
(Up Stairs.)

Aug. 1 1838.

It is to be distinctly understood, that for the period from January to July of the current year, 1838, no numbers of the Journal will be issued; and that the volume will commence with 1st July, 1838.

Post Masters are respectfully requested, in case a subscriber has removed from the place, or does not call for the Journal, to return the numbers, and inform to what place he has removed, or the reasons assigned for not taking the numbers out of the office.

PRINTED BY G. MITCHELL, 265 BOWERY.



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CIRCULAR.

with Annual Fair of the Mechanics' Institute of the City of New York.

Fair of the Institute will be held at Castle Garden, commencing Monday, September 8d, 1838.

At this exhibition may be rendered worthy of the arts, and of the ingenuity of American people, the managers appointed to conduct the approaching Fair, determined to make such liberal arrangements as will insure to the contributors opportunity of exhibiting their productions to the greatest advantage.

Object of Exhibition Fairs is to present to the members of the institute, and fellow citizens, who are engaged in the mechanic and fine arts, and in manufactures, the means of making their skill and ingenuity known in a way which no facilities afford: the many thousands who visit such exhibitions have a much opportunity of judging of the merits of the various productions, than they have by a mere verbal or newspaper description, besides the advantage of having brought together in one vast collection, the products of the skill, ingenuity, industry of our country.

Premiums of medals, diplomas, &c. will be awarded for ALL worthy or meritorious articles exhibited, either as it respects superior workmanship, machinery, or the operations are new, interesting or important, where ingenuity is displayed, or taste manifested, and particularly for all new and useful inventions.

Contributors are respectfully requested to send, for competition or exhibition, specimens of articles you manufacture; and you may be assured that the strictest impartiality will be observed in the distribution of the premiums.

Appropriate arrangements will also be made for the exhibition of specimens of workmanship in the fine arts, and competent judges will be appointed for their examination.

Every power will be provided for the accommodation of those who wish to exhibit machinery in operation; an experienced superintendent will take charge of this department, and contributors in this branch are particularly invited to send or bring machines or models as early as possible, on the 1st September, that the necessary arrangements may be made in relation to shafting, pulleys, &c.

In addition to the former method of conducting the fairs of this institute, places have been appropriated for the sale of light or fancy articles; which may be secured on application at the institute rooms, City Hall, where any information relating to the same may also be obtained.

O. WHITTLESY, *Chairman,* } *Board of Managers.*
JOHN HAROLD, *Secretary,* }

All articles for competition must be delivered to the committee, at Castle Garden, on the 1st September. Those for exhibition only will be received any day before the fair, before 10 o'clock A. M.

New York, June 18th, 1838.

RULES AND REGULATIONS.

The garden will be opened for the reception of goods, on Saturday, 1st of September, from 6 o'clock, A. M. until 9 o'clock, P. M., and it is respectfully urged that articles intended for competition may be sent in early in the day. Those articles intended for exhibition only will be received any day during the fair, before the hour A. M.

The fair will open for visitors on Monday, 3d September, at 10 o'clock A. M. and continue open every day of the exhibition till 10 o'clock, P. M.

Competent and impartial judges will be appointed to examine all articles presented, and premiums will be awarded on all such as shall be declared worthy.

The committee on premiums, and all firms or partnerships in which they may be interested, shall be excluded from competition or the award of any premium.

All persons depositing articles, either for competition or exhibition, must attend to them registered by the clerk, at which time they will receive a certificate, and will be required of them when the articles are returned.

Proof of origin must be furnished if required, for any specimen offered for premium.

Contributors will receive a ticket from the clerk, which will admit them with ladies to the exhibition.

Arrangements will be made to exhibit, in operation, all working models that are deposited—contributions in this branch are invited—a competent person will be charged with the care of all models sent for the above purpose.

9. The meeting of each day, until 35 minutes before 10 o'clock, shall be appointed exclusively to the judges.

10. Members will receive their tickets of admission by applying at the rooms, any time in the week previous to and during the exhibition.

11. All articles offered by apprentices, will be received, and adjudged as the decision of apprentices: they must furnish a certificate of name, age, with the time they have served as apprentices.

12. Articles subject to injury by being handled, should be secured in glass cases.

13. Contributors are requested to have a person to take charge of their goods during the hours of exhibition, as the managers cannot be responsible for any loss which may occur during that time: in the intervals, efficient measures will be taken for their protection.

NEW YORK & ERIE RAIL ROAD

NOTICE TO CONTRACTORS.

Sealed proposals will be received by the subscriber until Wednesday, 15th of August next, at 9 o'clock P. M. at the office of the company, at Tappan Station, Rockland County, New York, for the grading, bridging and masonry of ten miles at the eastern termination of the New York and Erie Railroad.

The maps and profiles, together with the specification and plans of the materials, and the manner of construction, will be ready for examination at any time after the 10th August next, at the office at Tappan; where all requisite information relative to the work will be given, and blank proposals furnished. Some of the sections will be heavy, and will require a considerable quantity of rock excavation.

Security will be required for the performance of contracts. Persons who are unknown to the subscriber, or to the Engineer, will be expected to furnish satisfactory testimonials. No transfer of contracts will be recognised. Individuals proposing for more work than they wish to contract for, must specify the quantity they wish to take.

The undersigned reserves the right of rejecting all propositions which appear incompatible with the interests of the company.

For further particulars, apply to H. C. SYMONS, Civil Engineer, Tappan, Rockland county, N. Y.

SAMUEL P. LYMAN,

Commissioner of the New York and Erie Railroad Company.

July 15, 1838.

LOCOMOTIVE ENGINES.

The subscribers have for sale in England, on account of whom it may concern:

Two very superior light locomotive engines with tenders, &c. complete. These engines are suitable for road, the superstructure of which are of wood with flat bars. They are of Hunt's celebrated pattern, and would no doubt give great satisfaction: ALSO—

Two 6 wheel engines of 11 tons weight, with fuel and water. These engines are

of very superior workmanship. One of them could be delivered at New York, and the other in Philadelphia;

ALSO—

Two 4 wheel engines, warranted by manufacturers not to weigh more than 4 tons, with fuel and water. These are of a lot of 8 made at one establishment, of a particular pattern. Some of them are now running, and give great satisfaction.

A. & G. RALESTON & CO.

South Front st. Philadelphia

Who have on hand 800 tons of T. & M. by 5-8. 2 by 1, 1 1/2 by 1, 1 1/4 by 1 1/2 by 1-4 flat bar rail road iron.

Rims for Locomotives, cars, &c. &c. for rail road iron executed as usual 3 2m

We ask the attention of our friends to the following notice of the Chief Engineer of the James River and Kanawha Company

NOTICE TO CONTRACTORS James' River and Kanawha Improvement—Virginia.

A public letting will be held at the town of Lynchburg, on the 12th September next, of all the work not now contracted, on the line of the canal between that place and the city of Richmond.

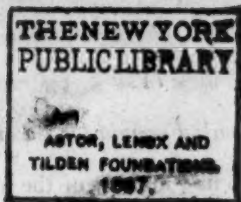
This work consists of 39 locks, 4 weirs, 3 aqueducts, 2 towing paths (one of which is across James' river), 120 farm and road bridges, and from 40 sections, besides several heavy locks between Lynchburg and the Blue Ridge.

The locks will generally be of double bottom sheathed with plank.

The situation of the work will be pointed out to contractors by the assistant engineers on the line; and the general specifications will be exhibited at the office of the subscriber, in the city of Richmond, until the 9th of September. The valley of the James River is remarkably healthy.

CHARLES ELLET,

Chief Engineer of the J. R. & K. Company.



AMERICAN
RAILROAD JOURNAL,
AND
MECHANICS' MAGAZINE.

No. 3, Vol. I.
New Series.

AUGUST 1, 1838.

[Whole No. 315.
Vol. VII.]

TO SUBSCRIBERS.

WE desire it to be distinctly understood by those who are indebted for the Journal, for *past years*, that we cannot continue to send it to them, after the *Sixth* number of the present volume, unless *arrearages* and for the current year shall have been paid. We do not adopt this rule from choice, but from necessity, that we may not be compelled again to suspend its publication, in consequence of the expense of a large edition, of which many are not paid for.

It is true our *rule* has been to require pay in advance—yet, like many other rules, it has been deviated from to oblige subscribers at a distance, who could not conveniently send us so *small* an amount, until the publication was suspended. It is, however, now published again, and will be cheerfully sent to all who have *already*, or may *soon* pay for the current year and arrearages.

✍ Send any thing that will pass here—even *Old United States Notes*—at our risk.

MECHANICS' MAGAZINE.

SUBSCRIBERS to the *late* Mechanics' Magazine, formerly published at this office, who paid to a period later than *July one, Eighteen hundred and thirty-seven*, are requested to receive this publication instead, for a period equal to that paid for the Magazine, as the two works are now united and published *semi-monthly*. Numbers 1 and 2 were sent, last week, to such as had paid for the Magazine to a period subsequent to *July 1, 1837*; the following numbers will hereafter be sent regularly, unless we are directed to the contrary—and we trust that those who receive it will aid us in extending its circulation.

REMARKS ON DE PAMBOUR'S FORMULA FOR LOCOMOTIVE ENGINES.

MESSRS. EDITORS,—In the first number of the new series of the Railroad Journal, I notice a letter from W. A. Talcott, Esq., to E. F. Johnson, Esq., Civil Engineer, containing remarks upon a tabular statement of the power of traction of Locomotive Engines, under different velocities, and a determined pressure of steam in the boiler, which was submitted by Mr. Johnson in a letter to the Directors of the New-York and Erie Railroad Company, and published in a former number of this Journal. This tabular statement Mr. Johnson computed from a formula furnished by De Pambour, and obtained results which Mr. Talcott shows to be contradictory, and charges it to the inaccuracy of the formula, declaring it to be "erroneous, giving results easily demonstrated to be false." To prove this assertion, he quotes an experiment made by De Pambour with the VESTA Engine, in which that Engine drew a load, including the tender, equal to 189 tons, on a level road, with a velocity of three miles per hour. To this Mr. Talcott applies De Pambour's formula for determining the load that an engine of a known limit of pressure will be able to draw at an assumed velocity, and obtains the monstrous result, that this engine, according to the formula, should have drawn 1061 tons! on a level road, at the given velocity; "thus showing a discrepancy in this instance between the result of the formula and experiment, of 872 tons."

It is evident that Mr. Talcott has misapplied the formula, which De Pambour has deduced with consummate skill, and verified by a series of carefully conducted experiments; for at the time of the above experiment, which was made in ascending an inclination of $\frac{1}{4}$, the engine was actually drawing its *maximum load*, with an effective pressure of 58 lbs. per square inch in the boiler, and the formula which De Pambour gives for ascertaining the maximum load of an engine, with a determined pressure, is

$$M = \frac{(P - \rho) d^2 l}{(\delta + n) D} - \frac{F}{\delta + n} \text{ where—}$$

M signifies the maximum load, tender included.

P— ρ " the effective pressure of steam in the boiler per square inch.

d " diameter of cylinder.

l " length of stroke of piston.

F " friction of engine.

δ " resistance per ton of load, = 8 lbs.

n " additional friction per ton of load = 1 lb.

D " diameter of driving wheel.

Applying this formula to the dimensions of the VESTA, and the pressure under which this engine performed the above experiment, we have

$$\frac{8352 \times 1.145}{9 \times 5} - \frac{187}{9} = 191.7 \text{ tons: certainly a widely different result}$$

from that of Mr. Talcott's communication of 1061 tons! and which result corresponds very nearly to that of the actual experiment, which gave 189 tons; differing only $2\frac{1}{4}$ tons.

The velocity with which an engine can move its maximum load is determined by its effective evaporating power, multiplied by the ratio of the volume of steam, at the total pressure of the steam in the boiler, to the volume of water that produced it, and the diameter of the driving wheels,—divided by the square of the diameter of the piston, multiplied by the

length of its stroke: $V = \frac{mSD}{d^2 l}$. Applying this formula to the VESTA,

the evaporating power of which engine S is = 39.39 cubic feet per hour, and where m the ratio of the volume of steam at the total pressure at the time of the experiment, to the volume of water that produced it, was 414, diameter of driving wheel, 5 feet; stroke, 1.33 feet; and diameter of cylinder, .9375 feet; we obtain a velocity of 71542 feet, per hour—equal to 13.5 miles, per hour. The velocity of the engine may be reduced below this point, as was the case in the experiment with the VESTA, where the velocity was three miles per hour, and in Mr. Johnson's table, where he assumes $7\frac{1}{2}$ miles per hour, but certainly *the load cannot be increased beyond its maximum.*

Mr. Johnson in his reply to Mr. Talcott's letter, frankly acknowledges that "too great haste" has betrayed him into erroneous results in his tabular statement; but instead of attributing this to the fact of having employed the formula, from which he computed his table, *beyond its proper limits*, he joins Mr. Talcott in viewing the formula incorrect in itself, saying that "the formula of De Pambour gives under a continued decrease of velocity a continued increase of power, and does not therefore designate the point at which it ceases to be applicable." We wonder at this remark of Mr. Johnson's, for De Pambour, after having established the formula which Messrs. Johnson and Talcott have used, says expressly:—"We must, however, add, that in all cases for the motion to be possible, the resistance on the piston must not be greater than the force that is to move it. Consequently, the resistance we have expressed by R must, at most, be equal to P . This observation fixes the limits of the possible load with a determined pressure. Beyond that point the equation may continue to give results, but they will no longer suit the question." Again, when treating the subject of the additional friction, De Pambour says—"As soon as the pressure in the cylinder becomes equal to that in the boiler, there is no further diminution of velocity that will permit to increase the load; for an increase of load requires an increase of moving power, which is no longer possible."

Messrs. Johnson and Talcott have fallen into this very error: notwithstanding De Pambour's repeated and forcible caution, they have continued the equation beyond the point where P is equal to R , and have obtained results which no longer suit the question, but which they chose to ascribe, unhesitatingly, to the errors and inaccuracy of De Pambour.

Mr. Talcott further says, that "this is not an insulated case in De Pambour's experiments," but "that there is a great difference in almost every instance, between the experiments and the results of the formula." We will see how far this bold assertion of Mr. Talcott is true; and take, for instance, an experiment made on the same day as the above, with the same engine, the VESTA, which drew on the 16th August, 1834, a load, including the tender, equal to 71 tons, on a level road, with a velocity of 24 miles per hour; the state of the spring balance showing an effective pressure of 53.25 lbs. per square inch. Here, then, let us apply the censured formula, and see how great a difference will appear between the result

thence deduced and the actual experiment:
$$M = \frac{m \text{ PSD} - \rho d^2 IV}{9VD} - \frac{F}{9}.$$

The letters here signify the same as above, and substituting the appropriate figures according to the dimensions of the engine, we have:—
$$\frac{(414 \times 9792 \times 39.39 \times 5) - (2117 \times .86 \times 1.33 \times 126720)}{(9 \times 126720 \times 5)} - \frac{187}{9} = 66 \text{ tons}$$

Thus it appears that this formula which De Pambour deduced from the

average results of numerous experiments with different engines, compared to the actual result of a given engine, yields a difference of only 5 tons. Certainly not sufficient to convince us of any incorrectness in the formula, as the remarks of Messrs. Johnson and Talcott would lead us to believe.

Mr. Johnson's table exhibits an engine weighing 13 tons, with 14 inch cylinder, 16 inch stroke, 4 feet 6 inch wheels, and 182 lbs. friction under a total pressure of steam in the boiler of 70 lbs. per square inch, drawing a load of 584 tons! Whence could this engine possibly attain such extraordinary power, being nearly double of what the best engines of similar dimensions, in this country, as well as in England, have hitherto been able to perform? And yet, Mr. Talcott, unhesitatingly, reasons upon this impossible result, and applying De Pambour's formula to it, finds a gross discrepancy, which is at once charged to a supposed error of De Pambour.

Let us, however, see what an engine of such proportions as Mr. Johnson assumed in his table is really able to perform, under a total pressure of

70 lbs. per square inch. Applying the formulæ, $M = \frac{(P-p)d^2 l}{(\delta+n) D} - \frac{F}{\delta \times n}$

which we have shown above to be correct, we have $\frac{(7963.2 \times 1.166^2 \times 1.333)}{9 \times 4.5}$

$\frac{182}{9} = 336$ tons. Showing a difference between the maximum load

that such an engine can move under a pressure of 70 lbs. per square inch, and the result which Mr. Johnson presents in his table, of 248 tons! The result which we have obtained from the formula accords well with what engines of similar proportions have actually performed.

We will further take this result and apply the formula for determining the resistance on the pistons, which formula Mr. Talcott admits as nearly correct, and makes use of it to demonstrate the incorrectness of the other

formula of De Pambour. $R = (F + \delta M + nM) \frac{D}{d^2 l} + p$. Here p signifies the atmospheric pressure, the other letters the same as above; substituting the appropriate figures we have $182 + 336 + 2688 \times \frac{54}{14^2 \times 16} + 14.7$

$= 69.9$ lbs. per square inch of surface of piston. Here, then, we have as the result of calculation according to the formula, a total resistance on the piston of 69.9 lbs. per unit of surface, while Mr. Johnson shows a total pressure of steam in the boiler of 70 lbs. per square inch. Surely here is no "great difference" between the result of the formulæ and that of the experiment, as Mr. Talcott would establish, but rather a close corroboration of theory by practice, as the most fastidious could require.

We will not pursue this subject any further at present, having, as we think sufficiently proved the general correctness of De Pambour's formula, which are rigorous deductions on well established principles of mechanics, from accurate and extensive experiments with engines of different construction, under various pressures, velocities and loads. And until Mr. Johnson demonstrates to us where De Pambour's "mode of conducting and analyzing his experiments" is improper or deficient, or Mr. Talcott "accomplishes more than has yet been effected by those who have heretofore written on the subject," we, with many others, must be permitted to admire the talent, industry, and care with which De Pambour has investigated, in the closet and on the road, this interesting and

important subject, and highly to value the accurate formula which, for our convenience, he has so ably prepared.

I am, Gentlemen, your obedient servant,

C. E. DETMOLD.

New-York, June 15, 1833.

Patent Process for Preserving Wood.

WE refer our readers to the advertisement on the cover, of Bill's Patent Process for Preserving Wood. This method, and particularly since it has been improved by H. B. Renwick, is well worthy the attention of Engineers and Builders. So far as we are able to judge, from the character of the material, the complete saturation of the longest pieces which has been effected, and the thorough seasoning which the wood undergoes in the course of the process, we are of opinion that wood thus prepared will be freed from all liability to the dry rot, and thoroughly protected from the attacks of the gribble worm; nor is this opinion founded upon inference alone, for we have satisfactory evidence that wood prepared by Mr. Bill had been exposed for five years in the fungus pit at Woolwich, and for the same space of time in harbour, when the worm was very destructive, and when it was alternately covered and left dry at each flux and reflux of the tide. Its importance in almost every department of civil engineering, and of architecture, is therefore obvious, and there is hardly any species of structure, of which wood is the material, in which it cannot be used to advantage.

We are happy to learn that this process is already attracting much attention. The Navy Commissioners have directed some of the prepared wood to be exposed in the waters of the Dock Yard at Norfolk; a Committee of the Board of Assistants of the Corporation of the City of New-York, has brought in a resolution to obtain a sufficient number of blocks prepared in this manner to cover a large extent of street; it has been favorably recommended to the Board of Directors of the Baltimore and Ohio Railroad, by their engineer.

For ourselves, we do not think it possible to speak in too strong terms of the benefit which may be derived from this process, in innumerable instances. The logs which are used in docking and building wharves may by it be thoroughly protected, and thus the continual injury to which our harbours are liable, may be prevented; the dangerous effluvia which arise from masses of decaying timber, and which are a certain source of disease, may be prevented; and the continual expense, arising from the necessity of renewal, obviated. In the paving of streets, the experiments

made in our city have been most satisfactory in demonstrating the very great superiority of wooden blocks over all other materials, except in durability; by this process wood may be rendered as lasting as stone. We therefore hope that our Corporation will not rest satisfied with allowing the resolution introduced by the Street Committee of one of their Boards to rest on the table, but will carry it into effect. In railroads it will ensure a saving in the scantling, by rendering it unnecessary to take the diminution of strength by decay into account, which will be equal to the whole cost of preparing the wood and purchasing the patent right, while it will make the cheapest and commonest wood equal, or even superior to locust.

We think that this process only needs the notice of Engineers to find favor with them. There are various uses to which such prepared timber can be applied, as in bridge building, or any other exposed situation for timber. We were particularly struck with its service as connected with Cram's Pile Driving Machine. We hope that this hint will be improved upon.

We annex a calculation relative to the cost of such timber for Railroads. —Sleepers for Railroads of the wood of the country through which the road passes, cost on an average about 30 cents; red cedar sleepers where they can be procured, cost 60 to 70 cents, say 60; the common sleepers last from four to six years, the red cedar eleven to thirteen; there are 1750 sleepers to the mile, and putting the different costs of the two kinds of sleepers at 30 cents, red cedar sleepers will cost \$525 00 more per mile than the ones which will last say six years; it will cost from 12 to 18 cents to saturate the common sleeper, containing about two cubic feet, with coal tar, the cost depending upon the kind of wood and length of carriage of the materials for saturation, thus making—taking the maximum—the cost of tarred sleepers to exceed the cost of the common wood ones by \$315 00 per mile, and they will last from thirty to forty years, if no longer, thus saving three or four removals of the whole materials, and taking up the whole road. The proprietors ask \$200 per mile of single track for the right of using the patent; therefore, the saturated sleepers will still cost less than cedar ones, besides lasting longer, and the Railroad will, in addition have the right of making lasting, at a small expense, its wooden rails, bridges, and other timber work, within the mile for which the \$200 is paid; as this payment gives the right of saturating all the other timber used as well as the sleepers. There is also another advantage—that much lighter iron rails may be used, as the wooden ones when saturated may be trusted, as they will not rot, to bear some considerable portion of the weight of the cars,

North Carolina Manufactories.

WE copy the annexed article, in relation to the present and prospective Manufactures of North Carolina, from the *Western Carolinian*, published at Salisbury, N. C. From this it is evident that the right spirit is aroused among the people of North Carolina; and the inference may be fairly drawn, that the period is not distant, when the immense natural advantages for manufacturing possessed by North Carolina and Virginia, above tide-water, will be called into profitable use.

It must be evident to even the most casual observer who travels through those States—as one of the editors of this Journal had the pleasure of doing extensively in 1823 and '24—that they are eventually to become as noted for, as they have heretofore been for want of, extensive manufactories; as they possess, in the first place, inexhaustible and valuable minerals of various kinds, as well as a soil and climate for cotton, and then the necessary water-power, to *any amount*, for manufacturing purposes. It is now only necessary for the people of North Carolina to turn their attention, in the full confidence of success, to the construction of Railroads, as they are doing to a considerable extent, connecting the interior and western counties with the seaboard, and the *Great West*—to give an impulse to manufacturing of various kinds, as well as to the improvement of their soil.

Cotton Manufactories in North Carolina.

Since we became proprietors of the *Carolinian*, we have taken some pains to obtain all the information within our reach, concerning the Cotton Manufactories in North Carolina, knowing that it would prove interesting to our readers. Our list is not yet complete, but even as far as it goes, many of our citizens will be surprised to see the progress North Carolina has made in the establishment of Manufactories: it should be recollected that all these establishments, with the exception of two or three, have sprung up within the past three or four years. The following is, as far as we can ascertain,

A LIST OF THE COTTON FACTORIES IN ACTUAL OPERATION IN N. CAROLINA.

1. Factory at the Falls of Tar River, in Edgecomb County. This is the oldest in the State; owned by a Company.
2. Factory near Lincolnton, Lincoln County, built by a Company, but is now owned by Mr. John Hoke.
3. One at Fayetteville, owned by Mr. Mallet.
4. Another at Fayetteville, owned by Mr. Blackwell, and others.
5. One in Greensborough—steam power—owned by Mr. Humphreys.
6. One at Milton, owned by an incorporated Company.
7. One at Mocksville, Davie County, owned by Mr. Thomas McNeely.
8. One, or perhaps two, in Orange County, owned by Companies.
9. One at Salem, steam power, recently started, owned by a Company.
10. One in Randolph County, owned by a Company.

11. One at Lexington, Davidson County—steam power—if not already started, will be within a few days; owned by a Company.

Besides these, there are others now in the progress of building, and will soon be in operation.

LIST OF FACTORIES NOW BEING BUILT.

1. One at Rockfish, near Fayetteville, a fine water power, owned by a Company.

2. One near Rockingham, in Richmond County, water power, owned by a Company.

3. One on Deep River, near Ashborough, owned by a Company.

4. One near Leaksville, on Dan River, building of stone, owned by John M. Morehead, Esq.

5. One in Surry County, on Hunting Creek, owned by Mr. Douthet.

6. One on the Yadkin a few miles below Stokes' Ferry, in Montgomery County, owned by Mr. Edward Burrage & Co.

7. One on the South Yadkin River, 10 miles N. W. of Salisbury; owned by Messrs. Fisher & Lemly.

We understand that several wealthy individuals have purchased the Buckhorn Shoals below Haywood, in Chatham County, with a view of erecting a Cotton Factory,—but have not learned whether they have yet commenced operations

It is also understood that an English gentleman has purchased Fullen-wider's Iron Works, intending not only to enlarge the Iron Establishment, but to erect a Woollen Manufactory.

We also learn that there is a large Cotton Manufactory either in actual operation, or will be soon, in North Hampton County.

Beside these, it is very probable that there may be one or two others in the State, either in actual operation, or in the progress of erecting.

From these facts it will be seen that North Carolina is making rapid progress in Cotton Manufacturing; and we think the work has just commenced. Her facilities are so great that the business once started, must go on. We have water power abundant, and cheap. We have the raw material at hand, and what is remarkable, labor in the Western Counties of North Carolina, is cheaper than in New England.

The effects of the Establishments already in operation begin to be felt throughout the State: three years ago immense quantities of Cotton yarns were brought into the State by our Merchants from the North, and sold to our citizens—now, not a hank is brought—our own establishments not only supply our wants for home consumption, but are beginning to export the article. Parcels of North Carolina yarns have already been sent to market in the City of New-York, and find a ready sale at fair profits.—Even now, several of our establishments are making preparations to commence the weaving of coarse cottons. We may venture the opinion that in two years North Carolina will not only supply the demand for our own consumption, with the coarser cotton fabrics, but also send them out for sale into the markets of the world. On the whole, the Manufacturers of the Northern States need not much longer count North Carolina as one of their markets; they may rather regard her as a competitor, and one, who from the great advantages she possesses will soon become very formidable.

Semi-Annual Report of the Water Commissioners, from the 1st of July to 30th December, 1837, inclusive.

(Continued from page 55.)

A very important portion of the plan for supplying this city with pure and wholesome water, is the manner of bringing it over the Harlaem River. The mode in which this shall be performed has caused much serious reflection, both to the Chief Engineer as well as to the Commissioners. In the hope of obtaining some useful information on this subject, one of the Commissioners, accompanied by the Chief Engineer, repaired to Georgetown, in the District of Columbia, for the purpose of inspecting the piers already built, and the plan for building and sinking the coffer dams for those piers still to be built, for crossing the River Potomac, with the Alexandria and Chesapeake Canal. The difficulties experienced, in putting down and clearing the coffer dams of water and mud, were immense; first, in driving the piles of the dam, and securing them from the effects of floods and tides; filling in the puddling of clay, in the space between the outer and inner row of piles, so as to exclude the water from without; and in clearing the dam of water and mud. The pressure of the puddling, on the timber in the first dam sunk by Captain Trumbull, the principal Engineer on the work, was so great that, in several instances, the main parts of the dam, although composed of large white oak logs, broke asunder. This dam was cleared of water nine times in the course of about eight weeks, and was as often refilled by undiscovered leaks; supposed to proceed from the omission to drive the outer sheet piling down to the rock, and from fissures in the rock, under the mud bottom. Continual accidents were occurring with the gearing of the pumps, and other parts of the machinery; and, although the Engineer had made considerable improvement in sinking the subsequent dams, both in the pumping apparatus in use, and the means for preventing leaks; we nevertheless saw and heard enough to convince us that if, in crossing the Harlaem River, the sinking of such immense piers can be avoided, a vast amount of trouble and expense would be saved to the city.

The Commissioners, in their report to your honourable body of 3d of July last, expressed a doubt whether it might not be necessary to apply to the Legislature for an additional and special act, authorizing the passage of the aqueduct over the Harlaem River; and that they had requested their Counsel, the Honourable D. B. Tallmadge, to examine the provision of the acts for supplying the city with pure and wholesome water; and to state whether, under those statutes the Commissioners are authorized to carry an aqueduct bridge over the Harlaem River, without further legislative authority. The opinion of Mr. Tallmadge was furnished the Commissioners on the 15th of July, twelve days after their semi-annual report was presented to your honorable body. He views the river, and land under it as belonging to the people of this State. That the original act, of the 2d of May, 1834, contemplates the bringing of the water from beyond the Harlaem River, consequently crossing it; and the subsequent acts, of May 11th and May 25th, 1836, confirms this fact; and also that the Croton River was to be used for supplying this city with water, and must be brought over the Harlaem River by means of an aqueduct bridge or inverted syphon, as the Commissioners shall upon consideration determine. Taking these three acts together, with the cases cited relative to questions which arose in the construction of the Erie Canal, he is of

opinion that no further legislation is necessary to authorize the Water Commissioners to erect a bridge for carrying the Croton Aqueduct across the Harlaem River." There are other important matters discussed, and legal opinions cited, in confirmation of this decision; for an elucidation of which we beg leave to refer to the opinion at length, a copy of which is hereunto annexed, marked B.

With a view of deciding the question, as to the best manner of bringing the Croton water across the Harlaem River, the Chief Engineer was instructed to furnish the Commissioners with an estimate of the cost of crossing said river by an aqueduct bridge on an inclined plane; and also by an inverted syphon, with iron pipes, on a low bridge. The following is a synopsis of so much of the report alluded to, as relates to the plan of construction, and some other matters connected with the subject.

It appears the width of the river on the high water level, was found to be 620 feet; and the distance across the valley of Harlaem River, from the grade of the aqueduct in the County of Westchester, to the grade of the same in the County of New-York, is 1,450 feet. The depth of the river, to the rock bottom, was found to be 32 feet below high water line, near the south shore; and only 20 feet, on the north shore.

The aqueduct bridge will have an elevation of 163 feet, above the rock at the bottom of the river, or an average of about 138 feet above tide. The span of the arches over the river must be 80 feet, and will regularly diminish to 50 feet span, for those to be built on the land. All the piers are to be constructed hollow, except those of 50 feet span, which are to be built up solid. The piers to be built of large stone, of uniform thickness in each course, and the joints not to exceed two and a half eighths of an inch. The work generally to be performed in the most approved manner practicable.

In making an estimate of the cost of this structure, the Chief Engineer observed, that he had been governed by the value of work of much similitude, estimated by several of the most competent men in the department of masonry; that there is no work under contract precisely similar, or of the same magnitude; or which from its elevation and inconvenience of access, will be so expensive in laying up, or requires so great a portion of large stone, or the same exactness of execution; at the same time, there is sufficient resemblance to constitute a guide; which with careful application, will not lead astray materially in computing the expense.

The estimate is given in the report in detail, and amounts in the aggregate as follows.

Estimate for a high bridge containing a uniform inclination
of aqueduct \$935,745

The plan of carrying the water across Harlaem River by an inverted syphon, is next considered. It is proposed to erect a semi-circular arch, of 80 feet span, resting on abutment piers. The total height of the arch, from the level of flood tide, to the under side of it, will be 50 feet. This arch is placed on the New York side of the river, and will form a sufficient channel way for navigation.

From the north abutment of the arch, to the Westchester side of the river, will be constructed an embankment of stone, by casting them into the river until a sufficient bed shall be formed to support the foundation wall of the aqueduct. From the south abutment pier of the main arch, on the New York side of the river, an arcade of three arches, will be built; one of 35, one of 30, one of 25, feet span; and, connected with this,

a foundation wall will be carried up the ascent, until it reaches the grade level, where the foundation and side walls are to be laid, to receive the pipes entering the effluent pipe chamber. The foundation walls, extending from the arcade of arches, and from the abutment of the channel arch, is to be formed of dry masonry; except two feet, constituting the face, and two feet across the top; to form the bed for the iron pipes; all of which to be laid in cement mortar.

A parapet wall will be laid on each side of the bed of the pipes, to support the earth covering; which is to be four feet deep, above the pipes, to protect the water from the effects of frost.

There will be an influent pipe chamber at the termination of the aqueduct on the north, or Westchester side of the river, in which the pipes are to be inserted. Commencing on this side of the river, at the influent pipe chamber, the pipes descend nearly with the slope of the hill, forming an angle near its base, and thence the lowest level; which determines the top of the foundation wall for the pipes, at four feet above flood tide. This level is continued to the angle, before rising to the channel arch; from whence an inclined plane carries the pipes to the effluent pipe chamber on the New York side of the river.

It is proposed to arrange the structure of the chambers, and foundation for the pipes, to accommodate four 36 inch cast iron conduits, whenever so many shall be required. Four *three feet pipes*, according to the calculation of the Engineers, will deliver 49,843,934 gallons of water every twenty-four hours; which is about the quantity calculated to be delivered by the aqueduct, and nearly the average quantity running in the Croton River. It is proposed, therefore, to insert only two of these pipes at present, they being deemed more than sufficient to supply the city with water for many years to come.

This estimate is reported in detail likewise, and amounts in the aggregate as follows:

GENERAL ESTIMATE for plan by inverted syphon and iron pipes \$426,027

The following is a comparison between the two plans as to the estimated cost of both of them:—

1st. THE HIGH BRIDGE, maintaining its established inclination over the river	\$935,745
2d. IRON PIPES, supported by a low bridge	426,027

Excess of expenses for the high bridge	\$509,718
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In addition to the report of the Chief Engineer, the Commissioners directed a contracted plan of the two methods of crossing the Harlaem River, to be prepared by Charles B. Pearson, Esq., an architectural draftsman, now in the employ of the Commissioners, which are herewith submitted for the inspection of your honorable body; and, at the same time, for a more full and satisfactory elucidation of this important subject, they beg leave to refer to the able report of the Chief Engineer hereunto annexed, marked, C.

It will be seen that the Chief Engineer expresses a decided opinion in favor of the plan by inverted syphon or pipes; and the Board of Commissioners, after due deliberation, have adopted said plan, as, in their opinion far preferable to that for crossing by a high bridge and inclined plane.

The reasons which have governed the Commissioners in this decision are as follows:

1st. The difference in the cost of carrying an aqueduct over the river,

on a bridge of 163 feet in height on seven immense stone piers, sunk in the water and mud, on an average of 25 feet below tide, with 80 feet span of arches, and that of conducting the water over a low bridge, requiring only one pier in the river, with an abutment, is sufficient of itself, in the opinion of the Commissioners, to decide the question.

2d. All the purposes and objects to be attained by the project, will as well be attained by the plan of a low bridge as by that of the high bridge, and at an expense of more than half a million of dollars less.

3d. The experience in sinking piers in so great a depth of water and mud, in order to reach the rock bottom, being very limited, and their great number and immense height, from the rock to the spring of the arches, although their construction is practicable, it must be attended with many unforeseen difficulties and casualties; and should the least variation from plan occur, or the least settlement on the foundation take place, it would carry with it very injurious results to the work; while with the low bridge and iron pipes, the same occurrence would be attended with but trifling injury, and could very soon be repaired.

4th. The water in a large aqueduct of masonry would, with much more uncertainty, be protected from frost on the high bridge, from the great elevated exposure and difficulty in surrounding it with a sufficient quantity of earth than when constructed on the land; while the iron pipes, from their comparative size, may be bedded in earth of sufficient depth and compactness, to avoid all possibility of being affected by the frost.

5th. The effects of leakage has been found very injurious to the aqueduct bridges on our canals, and it is therefore a part of our contract to line the aqueduct, when the crossing of streams on bridges is necessary, with plates of cast iron, in order to avoid the possibility of repairs, which might require the shutting out of the water while effecting them, and thus be attended with serious consequences to the city. This evil will be entirely avoided by the use of iron pipes; but should any thing occur to injure one of the pipes, the other would still be kept in operation, and conduct a sufficient supply of water through the aqueduct to the reservoir for all ordinary purposes.

6th. The time necessary to complete the high bridge would be considerably more than what would be required for constructing the low one, and a saving of time, in bringing to the city a sufficient supply of the Croton water, is a consideration worthy of attention.

7th. If the river should ever be made navigable, by the removal of the mills at Kingsbridge, and the obstruction of the dam at Macomb's Bridge, the facility afforded by the low bridge, of an archway of 80 feet in width, and 50 feet in height above full tide, will admit the passage of vessels of sufficient burthen and capacity, for every useful and necessary purpose, and the high bridge could do no more.

Although the Commissioners have thus decided, based upon the foregoing reasons, and in accordance with what they deemed their duty; they nevertheless admit, so far as architectural display is involved, that the high bridge has the preference; and if your honourable body should be of opinion, notwithstanding the great additional expense, that the aqueduct should cross the Harlem River on a high bridge, and will fortify that opinion by an ordinance, passed by both Boards and approved by the Mayor, the aqueduct shall be constructed in accordance with the provision of such ordinance.

The necessary surveys and levels, to ascertain the most suitable course for the aqueduct on the island of New-York, has only recently been

effected ; some demonstration, however, towards completing a plan, had been made, under the direction of Major Douglass ; but it was found necessary to go over the whole ground again, in order to arrive at a result satisfactory to the present Chief Engineer ; and an earlier attention to the subject was prevented by the pressing necessity of preparing the first and second divisions of the aqueduct for contract ; and also the great care required in a work of such magnitude and importance, that the first portions of the project should be well and permanently executed, as a guide and example for the future.

The result of these examinations carries the aqueduct from the Harlem River to the receiving reservoir as follows : it commences on the New-York side of the river, at the effluent pipe chamber, on land belonging, or lately belonging, to the estate of Stephen Jumell, where a tunnel of 200 feet is contemplated. It then takes a southerly course, crossing the land of Mr. Watkins ; then runs westerly on the land of Carman and Connor, and enters the 10th avenue at 151st street, where a tunnel averaging 45 feet below the surface, must be made from 140th to 135th street inclusive. The line then continues in the 10th avenue to 107th street, and makes a curve easterly to 104th street, and from thence runs parallel with, and 125 feet from the northerly line of the 9th avenue to 90th street, where another curve occurs, carrying the line to 85th street, where it enters the receiving reservoir. From this reservoir it is proposed to conduct the water through the 5th avenue to the distributing reservoir on Murray Hill, by iron pipes.

In following the line of aqueduct as above described, its grade will, in several places, be above the present surface of the ground, and from 102d to 95th street inclusive, in order to accommodate the carriageway and sidewalks, archways must be erected over the streets, and the aqueduct carried on a stone embankment of from 33 to 48 feet in height ; and in passing through the 5th avenue with the iron pipes to the distributing reservoir, a portion of the carriageway must be graded, in order that the pipes may be sunk to a proper depth below the surface of the street, not to be out of the reach of repairs, should any be at any time required, nor so near the surface as to be exposed to the action of frost.

The Commissioners submitted an estimate to your honorable body in their report of the 3d of July last, of the probable cost of completing the first and second divisions of the aqueduct, and promised to report an estimate of the total amount that would be required to complete the whole project, including the receiving reservoir between the 6th and 7th avenues and 79th and 86th streets, and the distributing reservoir on Murray Hill, in order that authority might be obtained from the Legislature to raise the additional funds required. The Chief Engineer has, accordingly, at the request of the Commissioners, furnished them with his views on the subject, so far as they relate to the operations of his department of the works, including the most substantial and economical mode of construction, with the probable mode of such projected construction ; and the Commissioners have added the actual cost of the land paid for, and the probable cost of that still to be acquired ; also the sum paid for the temporary use of land for roads and embankments, and the probable expense of what may still be required, with other damages and probable charges for water and land, incident to the undertaking ; also the amount already paid for salaries and other incidental expenses of the Commissioners already incurred, and including the amount that may be incurred ; the estimates thus embracing every expenditure already made and to be

made, from the commencement to the final completion of the work. In bringing together the several items which compose this estimate, an attempt has been made to cover every positive and probable expense, in the hope, at the same time, that the actual cost will be less than that stated; which the Commissioners will use every means in their power to effect, and thus a third application to the Legislature be avoided.

By a reference to the report of the Chief Engineer, alluded to above, it will be seen, that the crossing of the valley at Manhattanville, with the aqueduct, and the erection of the receiving and distributing reservoirs, are works of great magnitude and cost. For crossing the Manhattan Valley, three lines are designated, and an estimate furnished, for carrying the aqueduct on a high bridge from the north, to the south grade. The first line runs diagonally from 128th street, in the 9th avenue, to between 118th and 119th streets, in the 10th avenue. The second line crosses the valley and runs parallel with, and 125 feet from the 10th avenue. The third line continues through the centre of the 10th avenue.

The crossing of all these lines is to be effected by means of a bridge with semicircular arches of 50 feet span, similar to the diagram accompanying this report representing the high bridge over the Harlaem River.

The length of the three lines from grade on the north, to grade on the south side of the valley, are as follows:

First, or diagonal line	3,300 feet.
Second, 125 feet east of 10th avenue	3,700 feet.
Third line, running through the 10th avenue	3,700 feet.

The maximum elevation of the bridge above the natural surface of the ground to grade line, is about 103 feet, and to the top of the parapet wall 116 feet. To erect a bridge on the first or diagonal line, as per estimate, will cost

.	\$983,000 00
The same for the second line	1,286,880 00
The same for the third line	1,286,020 00

\$3,555,900 00

It thus appears that, making an average of the cost of crossing the valley on an arched bridge, by the three lines designated, and continuing the aqueduct on its regular inclination, will amount to \$1,188,633.

An estimate is then presented, for crossing the valley with pipes, or inverted syphons of three feet diameter. The estimate proceeds upon the principle, that only two pipes will be required at present, which will supply about nineteen millions of gallons per day, and allow thirty gallons to each person, of a population of 600,000 inhabitants; and in order to show the economy of the plan of crossing the valley by pipes, instead of an aqueduct bridge, a sum or capital is added to the estimate, the interest of which will pay for any additional number of pipes that may, in future be required, from time to time, as the population increases, sufficient to carry the whole produce of the Croton River to the reservoirs.

The estimate for crossing with four pipes of 3 feet diameter, all laid amounts to	\$453,670
For two pipes of same dimensions	303,926
For five pipes, all laid down	550,988
For only two pipes of the five laid down	346,372

It thus appears, if it should be deemed necessary to lay down four pipes in the first instance, at a cost of \$453,670, which would furnish thirty.

eight millions of gallons every twenty-four hours, there would still be a saving in the expense, by carrying the water over the valley by pipes, of \$734,963, adopting the average cost of carrying it by an aqueduct bridge ; and comparing the cost of building the bridge on the diagonal line, which is the cheapest, with the estimate for laying two pipes that will carry nineteen millions of gallons daily, there is still a saving by the latter plan of \$679,074.

The Commissioners were in hopes, as they had abandoned the idea of crossing the Harlaem River with an aqueduct bridge, that they would have been enabled to recommend the building of a similar structure for carrying the water over the Manhattan Valley ; a work that must have been an ornament to the city and a credit to the Corporation, as well as to the individuals having charge of its execution ; but the vast difference in the cost, has put it entirely out of the question, and they have accordingly adopted the plan of carrying the water over the valley by pipes or inverted syphons.

In adopting the foregoing plans, for conducting the water over the Harlaem River, and in crossing the valley at Manhattanville, on the island of New-York, both the Commissioners and the Engineers have been governed by a wish to reduce the cost of the work to the lowest possible sum, consistent with its durability and permanence. The plan, however, may be modified, both in those particulars as well as others, if deemed expedient by your honorable body, and a high bridge may be substituted, instead of the syphon at the Harlaem River and Manhattanville, by incurring an additional expenditure of *one million, one hundred and eighty-eight thousand, seven hundred and ninety-two dollars* ; and by delivering the water in the city, at a much less elevation than what has been contemplated, a lower grade may be adopted for the aqueduct, that would prevent its rising above the present surface on this Island. The Commissioners, however, do by no means recommend this deviation from the plan proposed ; but as some of their fellow citizens have expressed a solicitude that the water might be carried on an aqueduct bridge with architectural display, the Commissioners are disposed to be guided by the opinion legally expressed by your honorable body on the subject.

That the permanent grade of the several streets and avenues, adjacent to the line of the aqueduct, ought, as far as practicable, be made to conform to such line, the Commissioners think must be admitted ; and they trust, therefore, that the whole subject may be specially referred to a Joint Committee of both Boards and the Street Commissioner, with authority to take measures for opening and fixing the grade of such streets and avenues, through which the water is to pass ; and to adopt such modifications of the plan, on the Island of New-York, as shall seem most conducive to the end in view ; and the Commissioners and Chief Engineer promise to co-operate with such Committee, and to lend them all the assistance in their power.

The estimate for erecting the receiving reservoir, to have a depth of 20 to 25 feet of water, and to contain 158,000,000 gallons, is	\$310,500 00
The distributing reservoir of Murray Hill, will have an average elevation of about 31 feet, above the natural surface, and 40 feet above the established grade, and will be 420 feet square. The estimated cost is	295,340 00

The total cost of the reservoirs	\$605,840 00
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Amount brought forward,	\$605,840 00
The cost of the four divisions of the aqueduct, commencing at the Croton Reservoir, and ending at the receiving reservoir, including the crossing at the Harlaem River and the Manhattan Valley by pipes, amounts to	6,189,000 00
And for the connecting pipes, between the receiving and distributing reservoirs	499,110 00
Add for contingencies and superintendence, eight per cent.	583,516 00
Total estimate for aqueduct, engineering, &c.	\$7,877,466 00

To which must be added as follows :

Cash paid for land in fee, and estimated to be paid	501,158 00
Cash paid for temporary use of land, and estimated to be paid	12,175 00
Cash paid, and estimated to be paid, for salaries, postage, printing, travelling, stationery, Counsel and Chancery expenses, &c.	73,234 00

Total cost of completing the works, except the iron pipes for conducting the water through the streets of the city \$8,464,033 00

It therefore appears that a sum of about \$6,000,000 will be required for this object, in addition to the \$2,500,000, authorized by the "Act to provide for supplying the City of New-York with pure and wholesome water."

For much interesting information on this subject, we beg leave to refer to the report of the Chief Engineer, hereunto annexed, marked D.

The foregoing estimates for engineering, salaries, and contingent expenses, are based upon the calculation, that the work will require five years from this date to complete it. Should a less time be consumed, however, the cost of the aforesaid charges will of course be proportionably less. The sum required is more than \$3,000,000 over any of our former estimates, and can only be accounted for by the fact, that the Engineers, originally employed, did not possess the means of testing their calculations, by the actual cost of the work under contract, as we have been enabled to do. Your honorable body, however, were apprized of the fact, in our last report, that the "estimates of the Engineers, originally employed to make the necessary examinations, would fall far short, as the Commissioners have now good reason to think they will, of the sum necessary to bring the project to a successful termination;" and we added, "the Commissioners wish it to be understood, therefore, by your honorable body, as their settled opinion, based upon the result of the bids for that portion of the work offered for contract, and the very high price they have been compelled to pay for land and other privileges required for the works, that the total cost of the project will far exceed the estimates reported to the Common Council, founded upon data adopted by the Engineers in their reports dated the 1st of November, 1833, and 25th of January, 1835, and the 1st of February, 1835; all of which reports and estimates may be seen, by referring to the Documents of the Board of Aldermen, No. 36 of 1833, and No. 44 of 1835."

The Commissioners took the liberty, in their report of the 3d of July last, to suggest the propriety of appointing, by the Common Council, a Board of Commissioners, consisting of the Mayor, Comptroller, Counsel, Street Commissioner, and Chamberlain, to be denominated, *the Commis-*

New York and Albany Railroad.

sioners of the *Water Fund*, whose duties would consist, principally, in managing the fiscal concerns of the *Water Loans, &c.*; and for adjusting applications that may be made by the owners of land, or the contractors and others, for relief in cases not cognizable by the *Water Commissioners*, under the act. That another Board should be appointed, consisting of the before mentioned officers and the *Water Commissioners* jointly; and denominated the *Water Works Board*; and we cited the arrangement, by the Legislature of this State, in relation to similar matters, arising while building the canals, as an evidence of the utility of the measure; and we again beg leave respectfully to call the attention of the Common Council to the subject.

The Commissioners have thus stated, in detail, every transaction, of the least degree of interest, which has occurred since their semi-annual report, of the 3d of July last; and, consequently, this report has been extended far beyond the usual limits. The only apology they have to offer, for thus trespassing on your time, is, the construction they have given the provisions of the Act of the 5th of May, 1837, which appears to require a minute and detailed statement of every transaction of the Commissioners.

All which is respectfully submitted.

STEPHEN ALLEN,
WILLIAM W. FOX,
CHARLES DUSENBERRY,
SAUL ALLEY,
THOMAS T. WOODRUFF.

} *Water Commissioners.*

Office of the Water Commissioners, January 2, 1838.

New York and Albany Railroad.

At a meeting of the inhabitants of the counties of New York, Westchester, Putnam and Dutchess, held pursuant to previous notice, at White Plains, Westchester county, on the 7th day of July, 1838, Jonathan Aiken, Esq. of the county of Dutchess, was appointed chairman, and J. W. Tompkins, of Westchester county, secretary.

After the meeting had been organized, Joseph E. Bloomfield, Esq., the commissioner of the road, was requested to communicate such information as he possessed, in relation to the surveys now progressing, and the prospects of the company, and stated that during the last session of the legislature, an act had been obtained, extending the time for the commencement of the construction of the road for two years from the 18th of April last. That on the 2d of May last, the company was regularly organized by the election of thirteen directors, and \$750,000 of the stock (the amount required by the charter) subscribed. That immediately thereafter, he had proceeded to organize a corps of engineers, which had, since the 5th of May last, been continuing the survey of the line of the road from Milltown, in the county of Putnam, (where Joseph D. Allen, Esq., the engineer, in November, 1836, had terminated his survey) to Hillsdale, in the county of Columbia, 50½ miles. Mr. Bloomfield exhibited to the meeting the maps and profiles of the former as well as the last survey, and read to the meeting the following communication from Richard P. Morgan, Esq., the engineer having charge of the northern division of the line, as follows:

HILLSDALE, Columbia co., July 3d, 1838.

Joseph E. Bloomfield, Esq.:

DEAR SIR—I have proceeded with the surveys within four miles of this place, and have the pleasure of stating that the route has thus far fully equalled the expectations which have been entertained of it. We left off yesterday evening, 50 miles and a half from the point at which we began, which added to the distance on Mr. Allen's line, equals $102\frac{1}{2}$ miles—the estimated distance from this place to Albany by Spencertown, is 40 miles—our route will be extended probably 6 miles—making the aggregate distance from Harlaem only $148\frac{1}{2}$ miles. With respect to the several difficult points on our line, I have as yet found none requiring a grade over 30 feet to the mile; the general character of the route being level, or its equivalent. Our summit, which is in North East, is 752 feet above tide water. We are now gradually descending towards Hillsdale, and I flatter myself that I shall be able to intersect the *Hudson and Berkshire Railroad* in Ghent, without encountering any very serious obstacles. As you before intimated, I had better perhaps, from that point retrace my line, which though already good is susceptible of much improvement, and by making an approximate location, obtain the data necessary for an estimate of cost. I trust there will be found on this line facilities for cheap construction, as remarkable as the other striking advantages so far exhibited. I must not however omit to mention the favorable character also of our curvatures. In no case is it necessary to adopt a less radius than 2860 feet, and in general long strait lines can be selected, connected by very slight variation of direction or curvature scarcely perceptible. Very respectfully,

Your obedient servant,

RICHARD P. MORGAN.

The commissioner further stated to the meeting, that from the surveys already made, the line of the road opposite Sharon, in Connecticut, was 494 feet above tide water, giving an average descent of about $5\frac{1}{2}$ feet to a mile to tide water at Harlaem river. That 9-10ths. of the line is level, or under 20 feet inclination to a mile, and the highest inclination is 35 feet at two points, and those for short distances of about one mile each.

Whereupon, Jonathan Aiken and Jonathan A. Taber, Esqrs., were called upon by the meeting to communicate such information as they had obtained, and the views of the friends of the road in the counties of Putnam and Dutchess, and they stated that great anxiety was felt in those counties for immediate measures to insure the construction of this road. That they had lately held meetings in those counties, at which they had ascertained to their entire satisfaction, that the amount of stock required to construct the road through those counties would be subscribed immediately by the inhabitants in the vicinity, if the counties of New York and Westchester would subscribe the amount necessary to construct the road through Westchester, a distance of between 35 and 40 miles. That they had made full inquiries, and ascertained the probable amount of tonnage which would be transported upon the road when completed to Sharon, on the line of the state of Connecticut, a distance of less than 88 miles, at a cost of \$1,000,000 taken from the amount now transported by land to the Hudson river, and at present prices, without any allowance for passengers, or increased transportation, the receipts of the road would equal 24 per cent gross income upon the cost, and after paying all expenses would afford a net income to the stockholders of ten per cent.

Gouverneur Morris, Esq., of the county of Westchester, was then called upon, with the other gentlemen present from the counties of Westchester and New York, to state to the meeting whether they could obtain in sub-

scriptions sufficient to justify the construction of the road through the county of Westchester, and subscriptions to the amount of \$200,000 were immediately tendered to be used in the construction of the road in said county, in four districts as hereinafter mentioned, of which \$50,000 was offered by Gouverneur Morris, Esq., for himself, and \$60,000 for his friends at Morrissania.

Charles Henry Hall, President of the company, being called upon, responded by taking in behalf of himself and friends to the extent of \$300,000, to be expended in Westchester county, under the direction of the executive committee.

Ezra Hawley, Esq. of Catskill, on the behalf of the Catskill and Canajoharie railroad company, a prominent individual in aiding the construction of this important avenue to the west, attended the meeting, and stated that his company would continue their road to Hudson, and furnish every facility in conjunction with the Hudson and Berkshire railroad company to enable this company to intersect the last mentioned road, and thus form a continuous railroad communication from the far west to the city of New York.

On motion of Gouverneur Morris, Esq., it was resolved that this meeting recommend to the directors of the New York and Albany railroad company to prosecute immediately the survey of the line of the road from Harlaem river to Sharon, Ct., and that the present corps of engineers be increased, so as to have that line with the proposed alteration from Robbin's Mill to Newcastle, in the county of Westchester, completed by the 1st of September next.

That the line of said road be districted into nine districts, viz: 1st—From Harlaem river to Tuckeyho factory; 2—from last point to Robbins' mills; 3—from last point to Whitlockville; 4—from the last point to the Putnam county line at Owenville; 5—through the town of South-east, Putnam county; 6—through the town of Paterson to Dutchess county line; 7—through the town of Pawlings, Dutchess county; 8—through the town of Dover, Dutchess county; 9—through the town of Amenia to the state line opposite Sharon, Connecticut.

And that the directors appoint a resident agent in each district, with power to proceed immediately and obtain subscriptions for the stock from the inhabitants within each district, and negotiate with the owners of lands for the cession of the line of the road, of sufficient width to construct the same, and that each of said agents report weekly to the commissioner their proceedings.

On motion of J. W. Tompkins, it was further resolved, that in addition to the preceding powers to be conferred on said agents, it be recommended to the directors to empower said agents in obtaining the subscriptions for stock, to make the subscription conditional, to become absolute only when sufficient stock shall have been subscribed to cover the estimate by the engineer of the company, of the cost of constructing the road with a single track, and convenient turnouts from Harlaem river to Sharon, and that but $2\frac{1}{2}$ per cent. on the stock be paid on subscribing, and the other $2\frac{1}{2}$ per cent. on the 1st day of November next, and the residue by instalments of 5 or 10 per cent., as shall be required to meet the payments to the contractors in constructing the road; and that each of said agents be furnished with subscription books, and that all instalments paid on stock obtained on said books be paid to the agent in whose book such subscriptions are made, and by each retained and applied (except the first five per cent. required for expenses) in paying the contractors for the ex-

penses of constructing the road through his district, under the direction of the executive committee of the company, and that the deficiency on any district be made up from the subscriptions received by the directors out of such districts, or the excess over expenses on other districts.

On motion of Jonathan Aiken, Esq. it was resolved, that the following persons be and are hereby recommended as suitable persons to be appointed such agents:

- 1st district, Gouverneur Morris.
- 2d do. J. W. Tompkins.
- 3d do. Doct. Joshua Bowron.
- 4th do. Isaac Hart Purdy, Esq.
- 5th do. Hon. Ebenezer Foster.
- 6th do. John Towner, Esq.
- 7th do. Jona. Aiken.
- 8th do. John M. Ketchum.
- 9th do. Joseph D. Hunt.

On motion of Col. Lewis Morris, resolved, that J. E. Bloomfield, Esq. correspond from time to time with each of said agents, and furnish them with the necessary subscription book, papers, and instructions, and condensed statements of the reports received by him from the several agents—and that as soon as sufficient subscriptions are made to meet the expenses of constructing the road to Sharon, a meeting of all the directors and stockholders be called by him, at Somers, in the county of Westchester, to take measures for putting the whole line under contract.

On motion of Gouverneur Morris, Esq. resolved, that the directors be requested within sixty days from this date, to advertise and contract for the grading of the first section of the road from Harlem river, 5 miles to the head of Mill creek, through which the lands required for the road are already given to the company, and that sufficient subscriptions to meet the expenses of the same, are now tendered and ready to be paid to the directors.

The president and a majority of the directors of the New York and Albany railroad company, being present at the meeting, agreed to adopt and carry into execution without delay, the preceding resolutions.

On motion of Jonathan A. Taber, Esq. of Dutchess county, it was resolved, that the proceedings be published in the newspapers in the cities of New York and Albany, and in the counties of Westchester, Dutchess and Columbia, and in such other papers as the chairman shall direct; whereupon the meeting adjourned.

JONATHAN AIKEN, Chairmau.

J. W. TOMPKINS, Secretary.

First Annual Report of the Directors of the Auburn and Rochester Rail Road, made to the Stockholders—June 4th, 1838.

In making their Annual Report, the Directors of the Auburn and Rochester Rail Road Company, have the satisfaction of presenting to the stockholders, a favorable, though brief statement of the progress and prospects of the work.

The act incorporating this company, passed in May 1836, fixed its capital at two millions of dollars. The Commissioners found it difficult to obtain subscriptions of stock to that amount; and believing it unnecessarily large, they caused surveys and estimates to be made of the cost of the work. From the report of the engineer employed to make these calcula-

tions, it appeared that little more than one half the capital stated in the charter, would be required to construct the road, with a single track. An application was therefore made at the next session of the Legislature, and an amendment of the charter obtained, which authorised an organization of the company when one million and twenty-five thousand dollars should be subscribed. The books of subscription being again opened, this amount was promptly made up by citizens of the counties through which the road is located ; and in March, 1837, the Stockholders held a meeting at Geneva for the choice of Directors.

Soon after their election, the directors organized their Board ; and notwithstanding the unpropitious aspect of the times, they entered upon the discharge of their duties, by taking measures for an immediate examination and survey of the route. The increasing embarrassments of the times, enjoined great caution in the proceedings of the company ; but they presented no serious difficulty in these preliminary steps ; and in June they were commenced, and have been diligently prosecuted, under the direction of Mr. Robert Higham, an accomplished Engineer, whose industrious and efficient discharge of various and arduous duties thus far, has furnished the most satisfactory evidence that the Company were fortunate in his appointment to that responsible office.

With means in hand, the Directors did not permit the general embarrassments of the country, during the year past, to hinder this part of the undertaking : and it is believed as much has been effected, in surveying and locating the line, and in obtaining lands, as could have been accomplished under a better condition of business and money affairs. The experience, too, of similar companies elsewhere, has shown the impolicy of hastening these incipient steps ; especially in a district of country like this, which presents a choice of lines, and where re-surveys often point out a saving in distance, and in the expenses of lands and construction. An examination of what has been done, will exemplify the advantages of great deliberation in first measures ; and it is believed that no Company ever acquired accommodations on terms more favorable, nor met with a more enlightened liberality on the part of land holders.

At the last session of the Legislature, further amendments of the charter were obtained, simplifying the mode of appraisal of lands, &c., which will favor the operations of the Company.

The survey of the entire line for the road has been completed, and the road located, except that portion from the village of Auburn to the Cayuga Outlet, and through the village of Geneva, which has been deferred to give the stockholders residing at Geneva, an opportunity to express their opinions on the several proposed routes through their place.

X The location from Auburn to the Cayuga Outlet has been postponed, with a view of procuring permission from the Cayuga Bridge Company, to cross within the limits embraced in their charter, which prevents any companies or persons from erecting bridges or establishing ferries within three miles, on either side of their bridge.

The importance of having the bridge over the Genesee river completed this season, in order to make the embankment for the depot in the city of Rochester, the earth of which will have to be carted from the cutting on the east side of the river, induced the Directors to have the masonry of the bridge progressing earlier than other parts of the work ; and the Engineer was directed to receive proposals for the work. The proposals were received, the contract made, and the stone is now in course of delivery. To comply with the provision in the charter, requiring the

work to be commenced within a certain time, the Directors caused the grading on one section of the road to be commenced, early in the season, which is still in progress.

The books of the Engineer show that he has disbursed since his appointment.

For Engineers, procuring titles to lands, &c.	\$13,027 00
" Lands,	5,868 82
" Fencing	200 00
" Damages to buildings,	200 00
" Grading,	383 13
" Printing,	166 10
" Office rent, stationery, meetings of Directors, and other incidental expenses,	1,262 86

Making a total of \$21,207 91

The total amount of lands required for the road, is five hundred and sixty-one acres, exclusive of village property and depots. Of this amount 329 acres are under contract for \$16,476 00. The remainder, 232 acres, is estimated to cost \$28,415 00, making a total for lands of \$44,891 00, exclusive of village lots and depots. The ground for a depot in the city of Rochester, valued at \$18,500, has been given to the company. At other places similar donations are offered, but as the depots are not definitely located, the offers have not been accepted.

At a meeting of the Directors, held at Auburn on the 9th of May 1838, it was determined to put the whole of the grading under contract; and the Engineer was directed to advertise for proposals. The proposals will be received until the third day of July, immediately after which the work will be commenced, and prosecuted steadily to a completion.

* * * * *

Our own relative position acquires additional importance as we look at what is going on around us, and consider the effect upon our own interests, of measures projected in other states. The Auburn and Rochester Rail Road forms an important portion of an extensive line of communication, from east to west, through the great natural thoroughfare of business and travel, between the manufacturing districts of New England, and our own commercial mart, and the great agricultural country of the Lakes. From Boston to Buffalo, a distance of five hundred miles, connecting rail roads are in operation, or in progress of construction. The State of Massachusetts, whose sagacity long since discovered in the trade of the West, an object worthy contending for, has put forth an effort to secure an intercourse with that region, by subscribing two-thirds (\$2,100,000) of the stock of the Western Railroad Company; whose work extends from the west termination of the Boston and Worcester Railroad to the line of our State, there to connect with the Stockbridge and Albany Company. Pennsylvania, in her efforts to divert the products of the growing west, and the fabrics of the east, from this natural channel, will thus find an emulous competition in Massachusetts: and if the stupendous works of the former excite our jealousy, the spirited measures of the latter should stimulate this, and other kindred Companies, to an energetic prosecution of their works, until the entire line of communication from the Atlantic to Lake Erie be complete. All which is respectfully submitted,

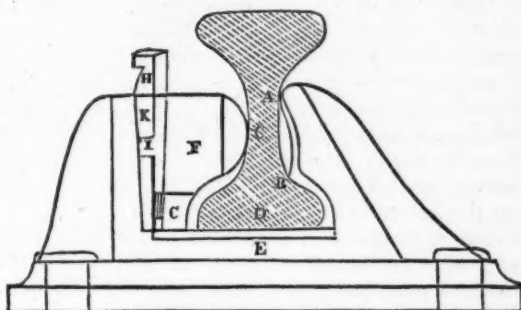
J. D. BENIS, *President.*

From the Civil Engineer and Architects' Journal.

Mr. Buck's Chairs for Parallel Π Rails.

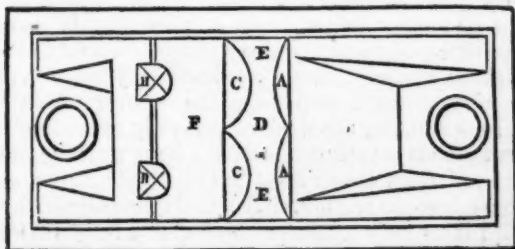
In the first place it is necessary to observe, that however strong a rail may be, a certain amount of deflection between the points of support must result from the gravity of the passing load; therefore, in order that no motion may be communicated to the chair (which is essential to the maintenance of the road in good order), the connexion between the rail and chair must be such as to allow of the libratory motion arising from deflection, the rail being nevertheless firmly fixed upon its seat, incapable of rising therefrom, and prevented from lateral movement; at the same time it should be free to move longitudinally as much as the expansion and contraction of its length from variation of temperature may demand. To attain these ends is the object of Mr. Buck's contrivance.

ELEVATION OF JOINT, OR DOUBLE CHAIR.



Scale of inches.

PLAN OF DOUBLE CHAIR, THE RAIL BEING OMITTED.



The above engravings contain a plan and elevation of a "joint, or double chair." The same letters refer to the same parts in both figures. In the elevation of the chair, the rail is sectionally represented in its place; in the plan it is omitted. The seat of the rail in the chair at D is convex, being $\frac{1}{8}$ of an inch higher than at E; this form permits the libratory motion of the rail on its seat at or near D, but it is not peculiar to the chair I am now describing; it has been adopted in others, and is sometimes called "cat-backed."

That side of the chair which is next to the flanges of the wheels has contact with the rail at only two points, A and B; these are blunt points, produced by the side of the chair being formed into spheroidal knobs; A is in contact with the vertical rib of the rail, and B with the superior part of the lower web, where a tangent to its curved surface forms an angle of 45 with the vertical. On the outer side of the chair the rail is confined to its place by a cast-iron "*chock*," or *filling-in piece*, F; that part of it next the rail is also made in a spheroidal form, and touches in a point only at c, about midway between A and B.

This chock has a step or foot G, resting on the seat of the chair, with a fillet I fitted into a corresponding groove in the chair, and the chock is wedged against the rail by means of the wrought-iron key H; this key is passed into a mortice, one-half of which is in the chock, and the other half in the chair, by which the key and chock are secured in their relative positions.

The mode of laying the rails in these chairs is as follows:—The blocks or sleepers, with the chairs affixed thereto, being previously laid in their places, the rails are dropped into the chairs (the width between A and K being sufficient for that purpose), and the chocks are then inserted horizontally, and wedged up by means of the keys H.

The effect produced by keying the chocks moderately tight against the rail at c, is to force the rail against the points A and B, and thereby, at the same time, down upon its seat at D, by the action of the point B, on the inclined surface of the rail in contact therewith. Now, it must be obvious, that so long as the key remains in its place, the rail is completely fixed laterally and vertically, and that it will be easily moved longitudinally, when contracted or expanded by difference of temperature: also, that the libration of the rail, occasioned by deflection, will produce only a very minute rubbing at the points A, B, and c.

A notch is made on the outer side of the head of each key for the purpose of extracting it by the application of a lever or pinch-bar.

The joint, or *double chair*, differs from the intermediate or *single chair*, only in being so much wider as to receive a double chock, with two knobs on it, each of which is keyed against the side of the end of one of the two rails which meet in the chair, the chock having two keys for that purpose. It may be objected that there is a chance of the keys getting loose, and jumping out of their mortices when a train may be passing at a high velocity; the most satisfactory answer to which is, that upon the London and Birmingham Railway, about four hundred yards in length have been laid by way of experiment with these chairs, over which the passenger trains have been running at velocities generally exceeding thirty miles an hour, without the least appearance of the keys working out; but, on the contrary, most of them have rusted fast into their places, and the points of contact have become smooth, and a little brightened by the libratory motion, which is an indication that these chairs fully answer the purpose intended.

In a rail weighing sixty-five pounds per yard, with four feet bearings, the space moved through at each deflection by that part of the rail which is in contact with the point c, is $\frac{1}{1000}$ of an inch.

These chairs are designed as a substitute for those now very generally adopted for similar rails, in which wood keys, or filling-in pieces, from 5 to 9 inches long, are used, and to which there are the following objections:—

First.—The keys, or filling-in pieces of wood, are liable to shrink in dry weather, and consequently to become loose and get out of their places.

Second.—Instead of keeping the rails down upon the seat, they lift them from it, and a blow is produced by the passing load forcing the rail down upon the seat of the chair.

Third.—In the joint chairs, one end of the key or filling-in piece is pressed down by the deflection of the rail, and at the same time the other end of it is elevated, whereby the butt-end of the contiguous rail, to which the wheel is advancing, is raised above the level of that upon which the wheel is at the instant pressing, and a shock is produced by the wheel coming into contact with the butt-end thus raised. This effect is produced when there is sufficient room in the chair for the play of the rail; but when the rail tightly fills the chair a rocking motion is communicated to the chair, and by the chair to the block, or sleeper, by which the road is rapidly put out of order.

Fourth.—The wood filling-in pieces will prove less durable than the cast-iron chocks, even supposing the wood to be Kyanized.

Railway Chairs.

SIR,—As Railway Engineering is now attracting a great portion of the public attention, perhaps the following simple suggestion may not be thought unworthy of the notice of those engaged in facilitating the operations of this popular branch of science. Yours, &c. C. L. O.

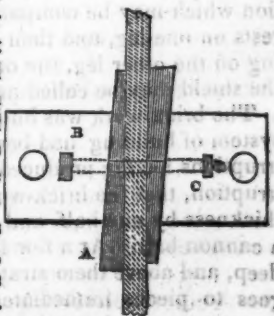
Experience having proved the importance of firmly fixing the rails into the chairs in all edge railways, and this operation being attended with some difficulty, the following plan is respectfully submitted to the consideration of engineers, &c.

Fig. 1 represents the section, and Fig. 2 the plan, of an edge rail *r*, the flange of which is of a dovetailed form, with an opening in the chair *c* of a similar shape, only much larger; between the rail and the chair are two wedges *a a* of compressed oak, or other hard wood, drove in the reverse way to each other, as shown in the plan, Fig. 2. *b* is a screw-bolt, passing through both sides of the chair, through both wedges and rail, and screwed upon the other side of the chair, thereby preventing the sides of the chair from being forced too far apart by the wedges. The wedges might first be drove tolerably tight, and a hole bored through them carefully, to admit the bolt, which being screwed fast in, would compress the rail so effectually, as to entirely prevent looseness or shaking; the hole in the rail should be made larger than the bolt, to admit of its being accurately adjusted. By this method the rails might be adjusted with the greatest nicety, either to the right or left, in case the chairs were not very accurately fixed upon the sleepers, &c., as the wedges on either side could be increased or reduced in

Fig. 1.



Fig. 2.



thickness as found requisite; the rails might likewise be slightly raised or lowered, by placing another small wedge underneath, either of wood or iron; and should the wedges at any time work loose, they might easily be replaced by fresh ones. Another advantage attending the adoption of this plan would be, that the wedges would yield slightly to the pressure caused by the expansion of the iron, and the whole might at any time be lightened by another turn of the screw-bolt; it must however be obvious, that the chairs must be of wrought-iron.

In the first instance, this plan might be attended with an increase of expense, but the advantages would, I think, greatly counterbalance it.

[In courtesy to our correspondent, we insert his letter and plan, which is ingenious, and have made such alterations as free it from those technical objections which would have otherwise been attached to it.—Ed.]—*Ib.*

(Continued from page 66.)

Minutes and Proceedings of the Institution of Civil Engineers, containing Abstracts of Papers, and of Conversation for the Sessions of 1837.

April 12, 1837.

The PRESIDENT in the Chair.

Mr. BRUNEL gave an account of the Thames Tunnel.—Having described the nature and difficulties of the undertaking, and the previous attempts which had been made by others to effect a similar work, he explained by reference to sections the nature of the strata below the river. He had adopted the rectangular form of the present excavation, because the work would set better than if of any other form, and had a better sustaining surface. The necessity of supporting the ground, and of having a sufficient shelter, had led to the adoption of the shield respecting which so much had been said. The construction of this would be understood by conceiving twelve boxes set side by side on their ends. These would represent the parallel frames which, standing side by side, but not in immediate contact, fill up the excavation. Each frame is divided into three boxes or cells, one above the other; the adjustment of the floors of which, and other details, were minutely described by Brunel.

Each frame is furnished with two large slings, by which it may derive support from or assist in supporting its neighbours; it has also two legs, and is advanced as it were by short steps, having for this purpose an articulation which may be compared to that of the human body. The frame rests on one leg, and then one side is hitched a little forward; then resting on the other leg, the other side is hitched a little, and so on. Hence the shield may be called an ambulating coffer-dam, going horizontally.

The brick-work was built in complete rings, and the advantages of this system of building had been fully proved by the fact of the two dreadful irruptions having produced no disruption. Such was the violence of the irruption, that the brick-work had in one part been suddenly reduced in thickness by one-half, and in one place there was a hole as if pierced by a cannon ball. At a few feet beneath them is a bed of quicksand 50 feet deep, and above them strata of most doubtful consistency, some of which goes to pieces immediately on being disturbed. Still, however, their progress is certain, and they only required patience to allow of the ground

above them acquiring sufficient density. He found gravel with a mixture of chalk or clay extremely impervious to water; in some cases he contrived to let the water flow from the sand above them, and thus obtained ground of sufficient density. In their progress they were considerably annoyed by land springs, which produced cutaneous eruptions, and destroyed the finger nails of the workmen.

April 18, 1837.

The PRESIDENT in the Chair.

Mr. Brunel gave further explanations respecting the Tunnel. He explained the way in which the ground above them had suddenly sunk down, owing to the run of a lower stratum of sand. This running sand which was a very great annoyance, consisted of *five* parts water and *one* sand. Bags of clay and gravel are not best where there are many stones; for the interstices do not become properly filled up; but in these cases the coarsest river sand is best; the water runs through at first, but soon stops; gravel and clay mixed are nearly impervious to water, but not so impervious as gravel and pounded chalk.

Mr. Gibb stated that he had found bags filled with clay and tow-waste exceedingly impervious to water. Being called upon to rebuild a sluice in a place where piling, owing to the stony nature of the ground, was impossible, he had formed a coffer-dam by laying down bags full of clay and tow-waste, in tiers of four, formed on the top of each other to the surface of the water.

The Ventilation of the Tunnel is effected by a pipe 15 inches square passing out under the fire-place of the steam-engine boiler.

"Description of a proposed Levelling Machine. By John Harrison."

Mr. Harrison proposes to construct a machine which should make its own section of the country as it passes over it. This machine, of which the general appearance is like a caravan, is to be drawn on four wheels by horses, the machinery being moved by the wheels of the carriage. A section is generally made by marking on the base line the lengths; and on perpendiculars through these points the heights; and joining the points so marked off. But in this machine the section is to be made by the continued motion of a point acted on by two forces, one of which would carry it in a horizontal line uniformly with the space gone over by the machine, and the other vertically, according as the machine is rising or falling. The machine is thus divided into two distinct parts for effecting these purposes, and the way in which this may be practically effected is described in detail by reference to an isometrical drawing accompanying the paper.

April 25, 1837.

The PRESIDENT in the Chair.

The paper by Mr. Beamish, which had been commenced at a previous meeting (April 2), was concluded.

Mr. Trubshaw presented to the Institution a model of the Centre employed by him in the construction of the Chester bridge.

The peculiar features of this Centre, which is described in detail in the

first Volume of the Transactions, consist in the absence of horizontal timbers, the timbers being so arranged that their load is received end-ways, and in the lagging being supported over each rib by a pair of folding wedges.

Mr. Trubshaw entered into the details of the construction and method of striking the Centre, explanatory of the account contained in the Transactions.

Mr. Macneill explained a method which he had recently adopted of laying down the sections of Railways so as to show at once to the eye the position of the cuttings and embankments; and a scale being laid upon the section, their heights and lengths are at once known, in the same way as by measurement on a detached section. This method will be understood by conceiving the line of railway traced on a map of the country, and a coloured part above to represent where a cutting has been made, and a differently coloured part below where an embankment has been made. The outlines of these will show at once the dimensions of the cuttings and embankments; in engraved plans, he should represent the cuttings by lines, and the embankments by dots, or stipling. The usual sections would of course be used by engineers, but a section similar to this would convey at once all the information requisite for committees. Two, or more lines being projected in this way, the reasons for selecting one in preference to the others would, in many cases, appear at a single glance.

Mr. Macneill proposes also to adopt the terms acclivity and declivity, with a rate marked after them. Starting then from the metropolis, or some principal town, all the ascents would be acclivities, and the descents declivities. Thus all the information generally required would be conveyed by the inspection of a single section.

(To be continued.)

Extract from the London Correspondence of the N. Y. Courier and Enquirer, of 9th June.

Its remarks on the "seven foot system" for Railroads, are well worth the attention of our readers. As to the "United States Asphaltum Company," referred to, which is formed for the purpose of "improving the ways of our principal cities," we are sure that it will find friends when it can be satisfactorily shown, that by its means the ways which its members pursue have been improved.

The subject of Atlantic steam navigation continues to attract universal attention here. Amongst the companies which have been formed is one called "The Atlantic Steam Navigation Company," which has purchased the large steam ship which was built at Liverpool last year by Sir John Tobin, purposely for the American trade. This vessel is equal in size to the British Queen, having engines of 500 horse power, and is intended to be fitted for sea in the course of a few weeks. At Bristol the greatest degree of enthusiasm prevails upon the subject, for at a meeting held at that city on the 7th instant, and which was attended by the mayor and all

the principal merchants of the place, it was asserted by one of the speakers "That they had now laid a rail road of 3000 miles across the sea." The people of Bristol appear indeed to look upon the establishment of steam navigation to New York, as destined to revive the trade of their now for a long time declining port—connecting the arrival and departure of the ships with the facility of travelling by the Great Western Railway to London, upon the completion of the line. Considering, however, that Bristol has great disadvantages in the difficult access to the port—the oppressive port-charges, and its distance from the great northern manufacturing towns, it is more than probable that Liverpool will still retain the superiority as the grand port of embarkation from England to the United States. Of the Great Western Railway, twenty-four miles were opened from London on the 4th inst. The tracks of this line are on a new system, being seven feet wide, and the rails are laid upon sleepers of wood eighteen feet in length. The advantages of this change in the construction of railways have become very apparent since the opening of the great western line; for the power of the locomotive engine is greatly increased by the proximity of the load to the moving power, as caused, by the greater width of the track: nor is any doubt entertained that the saving in steam locomotive power will more than compensate for the outlay in the purchase of a greater width of land which is required for the construction of the line. The "seven feet system" as it is termed by Mr. Brunel, the engineer to the Company, is probably worthy of much attention in the United States, where the land required for the construction of railways is generally much less valuable than in this country, and where, consequently, much greater advantages would be gained by the economy of the steam locomotive power. The rails also on the great western and Southampton lines, are laid upon felt, for the purpose of procuring an elastic and easier motion of the carriage, which has for the present been perfectly achieved—though some engineers are of opinion that they will cease to be experienced after a short period of pressure by the engines and trains, and the consequent consolidation of the felt.

"A company has lately been formed in London, called the "United States Asphaltum Company," for the purpose of supplying the Mastic of Sessel to the United States. The Directors of the Company are parties of great respectability, and the shares are at a premium of $1\frac{3}{4}$ to 2 per cent. They assert that the pavements in the average of the American cities, cost not less than 3s. 6d. per foot, whilst the Asphaltic pavement can be laid down at 1s. 4d. per foot, and thence that great profits must result to the company from contracts which they propose to obtain for the paving of the cities in the United States. Undoubtedly this substance is valuable as a substitute for stone, for an experience of five years has proved it to be impervious to heat, cold, or rain, and to be not cheaper only, but ten times more durable as pavement for streets—roofing, as a substitute for tiles, slates or shingles—cement for hydraulic works, and numerous other uses to which it has been extensively applied in Paris and other cities in France. The Mastic of Sessel is procured from the district of Piedmont in Switzerland, and is a bituminous limestone of rare occurrence in geology—the product apparently of subterranean volcanic fire, by which the bitumen has been driven upwards through a stratum of limestone, into which it enters in the proportion of about 10 per cent. So perfect is the saturation of the limestone, that no artificial composition of mastic, comparable to the natural substance, has yet been accomplished by

the numerous chemists who have lately been attempting its supercession both in England and France. The mining people in England and Scotland are attentively searching for a natural mastic in the various coal fields here, and probably a similar attention to the subject may be worthy of notice by the parties connected with the bituminous coal fields of Pennsylvania and the Western States. Should no natural Mastic be discovered in America, the company lately formed here will probably be a profitable one; for they have secured the exclusive right of supplying the Mastic of Sessel to every part of the United States, by which they will do "the state some service," if their representations be correct, that they can both have a sufficient profit from their operations, and reduce the rates for paving all the cities of the Union considerably more than half."

Steamboat Accidents.

We give the following extract of the late law on this subject from the *New-York American*. We are of the opinion that legislation, unaided by popular intelligence upon this subject, can do little or nothing—with such aid it can do every thing. We shall again advert to this subject.

Synopsis of a law to provide for the better security of the lives of passengers on board steamboats or vessels.

Sec. 1. Requires all vessels propelled in whole or in part by steam, to take out before the 1st Oct. next, a new license, subject to the conditions hereafter.

Sec. 2. Prohibits all vessels propelled as above, from transporting passengers or goods "in or upon the bays, lakes, rivers, or other navigable waters of the United States," after the 1st of Oct. without such new licence. Penalty for non-compliance five hundred dollars, for which a boat may be proceeded against summarily.

Sec. 3. Authorises the District Judge to appoint competent and faithful persons to inspect hulls, boilers, and machinery of every steam vessel, whenever requested so to do by the master or owner thereof, which inspectors are to furnish duplicate certificates of their inspection, and to take an oath faithfully to discharge their duty. No one to be appointed who is interested in the manufacture of steam engines or machinery.

Sec. 4. Requires the person appointed to *inspect the hull* of any steam boat, to state in his certificate the age of the boat, when and where built, and how long it has been running; and also whether the vessel is in his opinion sound and seaworthy. Fee \$5. to be paid by owner or master.

Sec. 5. Imposes the same duties on the persons required to *inspect the boilers*—the certificates to state the age thereof, and whether sound and fit for use. One copy of the certificate to be delivered to the Collector, the other to "be posted up, and kept in some conspicuous part of the boat." Fee as above.

Sec. 6. The inspection under the 4th Sec. to be made *once a year*, that under the 5th Sec. *twice a year*—the certificate of such inspection to be delivered by the owner or master to the Collector, under the penalty of forfeiture of the licence, and incurring the penalties of running without a licence. A "competent number of experienced and skilful engineers" to be kept by the owners on board every boat—and for neglect of doing so,

the owners and master liable "for all damages to the property or any passenger on board, occasioned by explosion or by derangement of the machinery."

Sec. 7. Requires under the penalty of \$200, that whenever the boat stops for passengers, freight or fuel, the safety-valve shall be opened "so as to keep the steam down in the boiler as near as practicable to what it is when the boat is under headway."

Sec. 8. Requires under penalty of \$300, boats navigating the lakes or the ocean, if not over 200 tons, to carry "two long-boats or yawls, each competent to carry at least twenty persons," larger steamers to carry at least three such yawls.

Sec. 9. Requires under like penalty all steamers referred to in Sec. 8. to carry with them an engine and suction-hose in good order, and to use iron rods or chains instead of tiller ropes.

Sec. 10. Requires steam vessels running between sunset and sunrise to carry lights—penalty \$200.

Sec. 11. All penalties to be sued for in the District Court, where the offence occurs, or where the owner or master resides. One half for the informer, the other for the United States.

Sec. 12. "Every captain, engineer, pilot, or other person employed on board a steamboat," through whose "negligence, misconduct, and inattention," life is lost, shall be deemed "*guilty of manslaughter*," and upon conviction, be sentenced to confinement at hard labor for not more than ten years.

Sec. 13. In all actions against steamboat owners or masters, the "bursting of the boiler, collapse of a flue, or injurious escape of steam," shall be taken as "full prima facie evidence, sufficient to charge the defendant, or those in his employ, with negligence, until he shall show there was no negligence by him or those in his employment."

The Editor of the American properly remarks—"Here is legislation enough. It now remains with travellers and with juries to give it full effect, upon the first and every fitting occasion."

Improvements in Steam Apparatus.

AN ACT authorizing the appointment of persons to test the usefulness of invention to improve and render safe the boilers of steam engines against explosions.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States be, and he hereby is, authorized to appoint three persons, one of whom at least shall be a man of experience and practical knowledge in the construction and use of the steam engine, and the others, by reason of their attainments and science, shall be competent judges of the usefulness of any invention designed to detect the causes of explosion in the boilers; which said persons shall jointly examine any inventions made for the purpose of detecting the cause and preventing the explosion of boilers, that shall be presented for their consideration; and if any one or more of such inventions or discoveries justify, in their judgment, the experiment, and the inventor desires that his invention

shall be subjected to the test, then the said persons may proceed and order such preparations to be made, and such experiments to be tried as in their judgments, may be necessary to determine the character and usefulness of any such invention.

SEC. 2. *And be it further enacted*, That the said Board shall give notice of the time and place of their meeting to examine such inventions, and shall direct the preparations to be tried, at such place as they shall deem most suitable and convenient for the purpose; and shall make full report of their doings to Congress at their next session.

SEC. 3. *And be it further enacted*, That to carry into effect the foregoing objects, there be, and hereby is, appropriated out of any money in the Treasury not otherwise appropriated, the sum of six thousand dollars; and so much thereof as shall be necessary for the above purposes shall be subject to the order of the said board, and to defray such expenses as shall be incurred by their direction, including three hundred dollars to each, for his personal services and expenses: *Provided, however*, And their accounts shall be settled at the Treasury, in the same manner as those of other public agents.

RH. M. JOHNSON,

Vice President of the United States and President of the Senate.

JAMES K. POLK,

Speaker of the House of Representatives.

APPROVED, June 28, 1838.

M. VAN BUREN.

Eastern Rail Road.—It is anticipated that the Eastern rail road will be in readiness to receive the cars in the course of three weeks. A considerable part of the rails are already laid down, and the whole supply of iron is received. We shall then be able to make the journey to Salem in the space of half an hour. Although the Eastern stage lines have for many years been distinguished for their rapidity and regularity, the journey between Salem and Boston will now be made in less than half the time of the shortest stage passage, and at a considerable reduction of price. We may therefore anticipate a more frequent and intimate intercourse between the residents of the two cities. *Boston D. Adv. July 17.*

Steam Ship Sirius.—We see that a mistake concerning this vessel is going the rounds of the papers—and therefore have to correct it. The Sirius is not to be withdrawn for the present from the Atlantic. The vessel which is to ply as a packet between London and St. Petersburg, though bearing the same name, is a new and beautiful *Iron Steamer*, finished in the spring purposely for that trade.

Milan, Dec. 19.—Three railways are about to be constructed in this city, viz., to Como, to Monza, and Venice. That to Como will be commenced immediately, the Austrian Government having already granted a patent for it to M. Bruschetti and Volta, engineers of Milan. M. Bruschetti, well known in Italy as the author of two admirable works on the navigable canals and irrigation of Lombardy, the only books which contain a complete history of the progress of the arts of irrigation and internal navigation in that part of Europe, will shortly visit England for the purpose of examining the railways in that country, and of purchasing the rails and locomotive engines necessary for those proposed in the *Austro-Italic States.*—*Lon. Morning Post.*

PRESERVATION OF TIMBER.

THE PROPRIETORS of the invention of Robert Bill, of London, by which timber may be saturated throughout with a preservative which has been found an efficient preservative against ordinary decay, the dry rot, and the gribble worm, having made such improvements thereon as have rendered the process more simple and efficient, are prepared to enter into contracts for the preparation of timber, and to dispose of the right of using the patent process.

The method in question is believed to afford a complete protection to wood, even in the most exposed and disadvantageous positions, and is less costly than any other which has yet been proposed. It is applicable to every case in which timber is employed: and is particularly worthy of attention in the blocks with which streets are paved, the rails and sleepers of railroads, the frames and planking of the gates of canal locks, the timber used in building docks and wharves, when the ravages of the worm are to be feared, and the piles and the beams used in every species of hydraulic construction. The details of the process may be learned, and terms made known, on application to

JAMES TREAT,

General Agent of the Proprietors,
No. 4, Wall st. New York.

Certificates.

I have witnessed a number of the experimental operations, made for the purpose of testing the practicability of Robert Bill's process for the preservation of timber. In these it was shown, that by the addition of improvements to the original method, the perfect seasoning of timber, by the separation both of its sap and uncombined moisture, could be effected: that almost every description of wood on which experiment was made, was thoroughly saturated with the protecting material; and that in the single instance, (hemlock,) through whose pores the injection was not complete, enough was done to exclude all access of moisture. The proprietors have certificates of the exposure of wood, prepared by Bill's method, to the most severe trials, for a space of five years; but were not this proof in their possession, it would be clear, from the high antiseptic properties of the material they employ, that wood, fully saturated with it, cannot be subjected to any of the ordinary causes of decay. The power of the same material to repel the gribble worm is universally admitted, even when merely applied as a coating; but when injected throughout, it must act as a perfect protection.

Columbia College, N. Y. May 23, 1838.

JAMES RENWICK, LL.D.

Professor of Natural and Experimental
Philosophy and Chemistry.

Certificate given by the British Government to Robert Bill.

"Timber prepared by Mr. Robert Bill was put into the dry rot pit in his Majesty's yard, Woolwich, where it remained for five years, and perfectly withstood the fungus rot, whilst numerous other specimens were destroyed in a fifth part of that time. Other pieces were placed in the sea, by the master shipwright at Sheerness; and while wood, considered impervious to the gribble worm, was nearly eaten up, these remained untouched. Some specimens of timber, so prepared were placed in the earth at his Majesty's yard, Deptford one half their length being buried, and the other half protruding above ground, and pieces cut from the same tree, but unprepared, were put in competition with them; at the end of five years the former remained unchanged, the latter entirely destroyed. These experiments prove that the inferior sorts of timber may be made, at a small expense, far more durable than oak, or perhaps any known wood, from which great national benefits may be derived.

JOHN KNOWLES,

Secretary of the Navy Board.

GENEVA, N. Y. 15th June, 1838.

Having seen several specimens of Wood saturated with Coal Tar (so called,) and believing its use would greatly tend to the preservation from decay of all exposed timber, in structures for Railroads, Bridges or Canals, I recommend its adoption, and believe said wood would prove to be one of the greatest elements of economy that has ever been introduced into works where timber forms a chief material.

J. G. SWIFT,

Lieut. of the U. S. Army.

PATENT HAMMERED RAILROAD, SHIP, AND BOAT SPIKES.

The Albany Iron and Nail Works, have always on hand, of their own manufacture, a large assortment of Rail Road, Ship and Boat Spikes, from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for Railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best Spikes in market, both as to quality and appearance.

All orders addressed to the subscriber at the works, will be promptly executed.

JNO. F. WINSLOW, Agt.

Albany Iron and Nail Works.

The above Spikes may be had at Factory prices of Erastus Corning, & Co., Albany; Hart & Merritt, New York; Jas. H. Whitney, do.; E. J. Etting, Philadelphia; Wm. E. Coffin & Co. Boston.

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ADVERTISEMENTS.

RAILWAY IRON, LOCOMOTIVES,

&c. &c.

THE subscribers offer the following articles for sale:—

Railway Iron, flat bars, with counterbore holes and milled joints.

350 tons 24", 15 1/2 in length, weighing 4 1/2 lbs

280 " 2 " 1/2 " " " 3 1/2 " "

70 " 1 1/2 " 1 " " " 2 1/2 " "

80 " 1 1/2 " 1 " " " 1 1/2 " "

90 " 1 " 1/2 " " " 1 " "

with Spikes and Splicing Plates adapted thereto. To be sold free of duty to State governments, or incorporated companies.

Orders for Pennsylvania Boiler Iron executed.

Rail Road Car and Locomotive Engine Tires, wrought and turned or unturned, ready to be fitted on the wheels, viz. 30, 33, 36, 42, 44, 54, and 60 inches diameter.

E. V. Patent Chain Cable Bolts for Railway Car axles, in lengths of 12 feet 6 inches, to 13 feet 2 1/2, 2 3/4, 3, 3 1/4, 3 1/2, and 3 3/4 inches diameter.

Chains for Inclined Planes, short and stay links, manufactured from the E. V. Cable Bolts, and proved at the greatest strain.

India Rubber Rope for Inclined Planes, made from New Zealand Wax.

Also, Patent Hemp Cordage for Inclined Planes and Canal Towing Lines.

Patent Felt for placing between the iron chair and stone block of Edge Railways.

Every description of Railway Iron, as well as Locomotive Engines, imported at the shortest notice, by the agency of one of our partners, who resides in England for this purpose.

A highly respectable American Engineer resides in England for the purpose of inspecting all Locomotives, Machinery, Railway Iron, &c. ordered through us.

A. & G. RALSTEN & CO.,

28 if Philadelphia, No. 4 South Front-st.

ARCHIMEDES WORKS.

(100 North Moore-street, N. Y.)

THE undersigned beg leave to inform the proprietors of Rail Roads, that they are prepared to furnish all kinds of Machinery for Rail Roads, Locomotive Engines of any size, Car Wheels, such as are now in successful operation on the Camden and Amboy Rail Road, none of which have failed.—Castings of all kinds, Wheels, Axles and Boxes, furnished at the shortest notice.

H. R. DUNHAM & CO.

New York, February 12th, 1836. 4—yt

FRAME BRIDGES AGAIN.

The subscriber will build Frame Bridges in any part of the United States, Maryland not excepted, and will extend them to as long a span, and warrant them to be as strong, durable, and cheap as those made by any other method.

Having no patent right, he requires no agents. A large number of bridges of his construction are to be seen. Young gentlemen, who wish, can be instructed in the true mathematical principles of building bridges, and the application of the same to practice.

JOHN JOHNSON.

Durington, Vt., Jan. 1838.

MACHINE WORKS OF ROGERS,

KETCHUM AND GROSVENOR, Paterson,

New-Jersey. The undersigned receive orders for the following articles, manufactured by them, of the most superior description in every particular. Their works being extensive, and the number of hands employed being large, they are enabled to execute both large and small orders with promptness and dispatch.

RAILROAD WORK.

Locomotive Steam-Engines and Tenders; Driving and other Locomotive Wheels, Axles Springs and Flange Tires; Car Wheels of cast iron, from a variety of patterns, and Chills; Car Wheels of cast iron, with wrought Tires; Axles of best American refined iron; Springs; Boxes and Bolts for Cars.

COTTON, WOOL, & FLAX MACHINERY,

Of all descriptions and of the most improved patterns, Style, and Workmanship.

Mill Geering and Millwright work generally; Hydraulic and other Presses; Press Screws; Callenders; Lathes and Tools of all kinds; Iron and Brass Castings of all descriptions.

ROGERS, KETCHUM & GROSVENOR,

Paterson, N. J. or 60 Wall-st. New-York 51tf

FRAME BRIDGES.

THE undersigned, General Agent of Col. S. H. LONG, to build Bridges, or vend the right to others to build on his Patent Plan, would respectfully inform Railroad and Bridge Corporations, that he is prepared to make contracts to build, and furnish all materials for superstructures of the kind, in any part of the United States, (Maryland excepted.)

Bridges on the above plan are to be seen at the following localities, viz. On the main road leading from Baltimore to Washington; two miles from the former place. Across the Motawamkeag river on the Military road in Maine. On the national road in Illinois, at sundry points. On the Baltimore and Susquehanna Railroad at three points. On the Hudson and Paterson Railroad in two places. On the Boston and Worcester Railroad, at several points. On the Boston and Providence Railroad, at sundry points. Across the Contoocook river at Henniker, N. H. Across the Souhegan river, at Milford, N. H. Across the Connecticut river, at Hancock, N. H. Across the Androscoggin river, at Turber Centre, Maine. Across the Kennebec river, at Waterville, Maine. Across the Genesee river, at Squakiehill, Mount Morris, N. Y. Across the White River, at Hartford, Vt. Across the Connecticut River at Lebanon, N. H. Across the mouth of the Broken Straw Creek, Penn. Across the mouth of the Catarangus Creek, N. Y. A Railroad Bridge diagonally across the Erie Canal, in the City of Rochester, N. Y. A Railroad Bridge at Upper Still Water, Orono, Maine. This Bridge is 500 feet in length; one of the spans is over 200 feet. It is probably the firmest wooden bridge ever built in America.

Notwithstanding his present engagements to build between twenty and thirty Railroad Bridges, and several common bridges, several of which are now in progress of construction, the subscriber will promptly attend to business of the kind to much greater extent and on liberal terms.

MOSES LONG.

Rochester, Jan. 19th, 1836.

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ADVERTISEMENTS

GREAT TURNPIKE LETTING ON THE ZANESVILLE AND MAYS- VILLE ROAD.

*Important to Contractors, Masons, and
Laborers, and well worth their attention.*

Sealed proposals, enclosing recommendations, will be received for the construction of sixty-six miles of the Zanesville and Maysville Turnpike Road, including Graduation, Bridging and Cover, viz: 11 miles in Muskingum county; 14 in Perry; 12 miles in Fairfield; 11 in Ross; 13 in Adams, and 5 in Brown county, Ohio. By the 30th day of July next, notes, profiles and specifications, for the respective counties will be left for the inspection of Contractors with the following persons, who are authorized to receive proposals for their respective parts of the road, viz: Solomon Sturges in Putnam; Henry Dittoe in Somerset; Elnathan Seofield in Lancaster; John Madeira in Chillicothe; A. Hollingsworth in West Union, and E. Campbell in Aberdeen, opposite to Mayesville, Ky.

The Superintendent will attend on the line to read the notes, and make the necessary explanations from Aberdeen to West Union on July 23d; from Chillicothe to Lancaster on the 26th; from Lancaster to Somerset on the 27th, and from Somerset to Putnam on the 28th, leaving suitable assistants to continue the explanations in his absence, although it is desirable that Contractors attend with the Superintendent on the respective parts. Proposals must be endorsed "Proposals," to distinguish them from letters, and be given in by nine o'clock, A. M. on the days of letting.

The lettings, together with such further explanations as may be convenient, will proceed as follows, to wit:

That part of the road in Muskingum will be let at Putnam on the 30th of July next.

In Perry, at Somerset, on August 1st.

In Fairfield, at Lancaster, August 3d.

In Ross, at Chillicothe, on August 6th.

And at Aberdeen, for Adams and Brown, on August 9th.

Contracts will be entered into on the days of letting for the respective counties. The road in the different counties must be proposed for separately. Minor arrangements will be made known at the time.

Labourers, take Notice.

It is intended very promptly to organize a force of one thousand strong upon this road immediately after the letting, so that most of the graduation and bridging may be done this year. The district of country through which this road passes is not surpassed, if equalled, for healthiness or plentifulness in the United States.

JOHN S. WILLIAMS, Superintendent.

Lancaster, June 14, 1838.

PATENT AGENCY OFFICE AT WASHINGTON.

WILLIAM P. ELLIOTT, Artist, for many years employed in the Patent Office, will devote a portion of his time to the preparation of papers and drawings for applicants for Patents, and attend to the procuring of patents for useful inventions without the necessity of a journey to Washington; and will give information by mail, as to the originality of the same, previous to applying for patents.

All communications must be free of postage. His Office is in room No. 10, Patent Office Buildings, Washington, D. C.

Washington, April 20, 1838.

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PATENT SAFETY FUSE, *For Igniting the Charge in Blasting Rocks, both in dry places and under water.*

To those acquainted with and accustomed to using the Fuse, comment or description is unnecessary; to those who are not, we would simply observe, that it is an important invention to persons employed or concerned in Blasting, as by its use that hitherto dangerous operation is rendered as safe as the ordinary employments of the Farmer. It insures certainty, and effects an explosion as well under water as in the driest situation, adds much to the force of the blast, and by rendering the priming needle unnecessary, saves much time.

Numerous certificates from those who have tested the Fuse, might be given, but the following is deemed sufficient.

CERTIFICATE.

Having seen the Patent Safety Fuse for Blasting tested to our satisfaction, we cheerfully certify, that we are convinced that it saves much time and labor -- adds to the force of the blast -- ensures certainty, and renders blasting perfectly safe. Besides, it is, we think, CHEAPER than the common straw Fuse. For dry blasting it is a great improvement; but for blasting in wet ground, it is invaluable. Messrs. F. Hitchins & Co., contractors on the Erie canal, certify that they have been engaged in the Cornish mines, England, where the Fuse is exclusively used, and that it has never to their knowledge, caused a miscarriage. They confirm our above expressed opinion of its value. We make no doubt that it will soon be in universal use in blasting operations.

DAVID HAMILTON,

Superintendent repairs, Erie Canal.

W. J. McALPINE,

Assistant Engineer Erie Canal Enlargement.

J. HOUGHTON,

Engineer Cohoes Company.

COROKS, December 16, 1837.

The Fuse is manufactured by Baron, Rickford, Eales and Co. at Simsbury, Hartford Co., Conn., orders directed to them, or either of their agents, will be promptly attended to.

Agents for selling the Patent Safety Fuse.

David Watkinson & Co., Hartford, Conn.

A. G. Hazard & Co., 135 Front-st., N. Y.

Erastus Corning & Co., 361 South Market-street, Albany, N. Y.

E. F. & A. G. Smith, 29 Exchange-street, Rochester, N. Y.

H. Kingman & Co., Buffalo, N. Y.

Curtis & Hand, 16 Commerce-street Philadelphia, Penn.

Pratt & Keith, South Charles-street, Baltimore, MD.

G. R. Peake, Richmond, Va.

W. B. Peake, Fredericksburgh, Va.

SHEET LEAD, &c.

THE Subscribers, Manufacturers of Sheet Lead, Lead Pipe, Red Lead and Litharge -- have always an assortment in store, and for sale, at 175 Front Street, corner of Burling Slip.

CORNELL & TUCKER.

Sheet Lead and Lead Pipe for Fortifications and Engineering, Milled any thickness and size to order.

New-York, March 13, 1838.

2.

TO SUBSCRIBERS.

In consequence of the suspension, for several months, of its publication, the present, or *Seventh* volume, will be commenced on the 1st of July—instead of January, 1838: and the work will hereafter form *two* volumes each year.

* * The **MECHANICS' MAGAZINE**, heretofore published as a separate work, will from this date be united with the *Railroad Journal*, and the publication will hereafter bear the title of *Railroad Journal and Mechanics' Magazine*, and be forwarded to those who have paid for the *Mechanics' Magazine* to a period subsequent to July 2 1837, until they shall have received as many months of this, as they paid for that work—or until otherwise ordered, if paid for in advance.

The terms are Five Dollars per annum, *in advance*.

We ask the attention of contractors to the following notice of the Central Rail-Road Company of Georgia.

NOTICE TO CONTRACTORS.

Central Rail-Road of Georgia.

Sealed proposals will be received at the office of the Engineer in Savannah until the 1st day of August next, for grading twenty-one miles of this road, from the western end of the present contracts to the Ogeechee river, being one hundred miles from this city. The work will be divided into sections of three miles each, and plans and profiles ready for inspection after the 10th of July. Further lettings, including a bridge over the Ogeechee River, will take place soon after the above.

L. O. REYNOLDS, *Chief Engineer*.

Savannah, June 2d, 1838.

THE NEWCASTLE MANUFACTURING COMPANY

Continue to furnish at the works situated in the town of Newcastle, Delaware, *Locomotive and other Steam Engines*—Jack Screws, Wrought-iron work and Brass and Iron Castings, of all kinds, connected with Steamboats, Railroads, &c. Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with axles fitted, also with wrought Tires; Springs, Boxes and Bolts for Cars; Driving and other Wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and dispatch. Communications addressed to Mr. William H. Dobb, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,

President of the Newcastle Manufacturing Co. Newcastle, Del. March 6, 1838.

NEW ARRANGEMENT.

ROPES FOR INCLINED PLANES OF RAILROADS.

WE the subscribers have formed a co partnership under the style and firm of Folger & Coleman, for the manufacturing and selling of Ropes for inclined planes of railroads, and for other uses, offer to supply ropes for inclined planes, of any length required without splice, at short notice, the manufacturing of cordage, heretofore carried on by S. S. Durfee & Co., will be done by the new firm, the same superintendant and machinery are employed by the new firm that were employed by S. S. Durfee & Co. All orders will be properly attended to, and ropes will be shipped to any port in the United States.

12th month, 19th, 1836. Hudson, Columbia County, State of New-York.

ROBT. C. FOLGER.
GEORGE COLEMAN.

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PATENT RAILROAD, SHIP AND BOAT SPIKES.

*. The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years successful operation, and now almost universal use in the United States, (as well as England, where the subscriber obtained a patent) are found superior to any yet ever offered in market.

Railroad companies may be supplied with Spikes having countersunk heads suitable to the holes in iron rails, to any amount and on short notice. Almost all the Railroads now in progress in the United States are fastened with Spikes made at the above-named factory—for which purpose they are found invaluable, as their adhesion is more than double any common Spikes made by the hammer.

*. All orders directed to the Agent, Troy, N.Y., will be punctually attended to.

HENRY BURDEN, Agent.

Troy, N.Y., July, 1831.

*. Spikes are kept for sale, at factory prices, by J. & J. Townsend, Albany, and the principal Iron Merchants in Albany and Troy; J. I. Brower, 223 Water-street, New-York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrad & Smith, Boston.

P. S.—Railroad companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing as so to keep pace with the daily increasing demand for his Spikes.

1838

H. BURDEN.

NOTICE.—To all whom it may concern.

The undersigned gives notice that he has invented a useful improvement in the construction of Railroad Car wheels, which has been tried for several months on the Beaver Meadow Railroad. The undersigned was preparing to take out a patent of the same, when a certain Henry Moore, who had been instructed by the undersigned and employed for some time in casting said wheels, surreptitiously made a casting from his model and secretly despatched a messenger to Washington to obtain a patent for himself, which the undersigned is informed the said Moore has done, and is offering rights for sale. Now this is to notify all persons to beware of purchasing rights under said patent, as the claim of said Moore will be earnestly contested before the proper tribunals of justice.

HOPKIN THOMAS.

Beaver Meadow, March 25, 1838. 7yl-4